Courses Specifications

AL SAEED UNIVERSITY
Faculty of Medical and Health Sciences
Department of Pharmaceutical Sciences

Title of the Program: Bachelor of pharmaceutical Sciences (B. Pharm. Sc)

2024/2023

Republic of Yemen
Ministry of Higher Education & Scientific Research
Council for Accreditation & Quality Assurance
Al-Saeed University
Faculty of Medical and Health Sciences
Pharmaceutical Sciences Department

الجمهورية اليمنية
وزارة التعليم العالي والبحث العلمي
مجلس الاعتماد الأكاديمي وضمان جودة التعليم
جامعة السعيد
كلية العلوم الطبية والصحية
قسم العلوم الصيدلانية

الخطة الاسترشادية لبرنامج بكالوريوس العلوم الصيدلانية (171 ساعة معتمدة)

المستوى	الفصل الدراسي الأول								الفصل الدراسي الثاني							
	رمز المقرر	اسم المقرر Course Name	الساعات المعتمدة						رمز المقرر	اسم المقرر Course Name	الساعات المعتمدة					
			نظري	عملي	تمارين	الاجمالي					نظري	عملي	تمارين	الاجمالي		
المستوى الأول	ARB101	لغة عربية (1)	2	0	0	2			ARB102	لغة عربية (2)	2	0	0	2		
	ENG101	لغة انجليزية (1)	2	0	0	2			ENG102	لغة انجليزية (2)	2	0	0	2		
	ITP101	مهارات الحاسوب	2	1	0	3			ISL101	ثقافة إسلامية	2	0	0	2		
	COM101	مهارات الاتصال	2	0	0	2			PHA122	تشريح وانسجة	2	1	0	3		
	MED111	بيولوجي عام	2	1	0	3			PHA123	حسابات صيدلانية	2	0	0	2		
	MED112	كيمياء عامة	2	1	0	3			PHA151	صيدلة فيزيائية	2	1	0	3		
	PHA121	مدخل إلى علم الصيدلة	1	0	0	1			PHA171	علم النبات الصيدلاني	2	1	0	3		
		إجمالي الساعات المعتمدة				16				إجمالي الساعات المعتمدة				17		
المستوى الثاني	MED213	علم الاحياء الدقيقة	2	1	0	3			MED215	كيمياء تحليلية	2	1	0	3		
	MED214	كيمياء عضوية	2	1	0	3			PHA225	علم وظائف الاعضاء (2)	2	0	0	2		
	PHA224	علم وظائف الاعضاء (1)	2	0	0	2			PHA231	كيمياء عضوية صيدلانية	2	1	0	3		
	PHA241	كيمياء حيوية (1)	2	0	0	2			PHA242	كيمياء حيوية (2)	2	1	0	3		
	PHA252	صيدلانيات (1)	2	1	0	3			PHA243	علم الاحياء الدقيقة الصيدلاني	2	1	0	3		
	PHA272	علم العقاقير (1)	2	1	0	3			PHA253	صيدلانيات (2)	2	1	0	3		
	PHA281	تشريعات واخلاقيات الصيدلة	2	0	0	2			PHA273	علم العقاقير (2)	2	1	0	3		
		إجمالي الساعات المعتمدة				18				إجمالي الساعات المعتمدة				20		
المستوى الثالث	PHA326	علم وظائف الأعضاء المرضي	2	0	0	2			PHA333	كيمياء دوائية (2)	2	1	0	3		
	PHA332	كيمياء دوائية (1)	2	0	0	2			PHA334	تحليل الي صيدلاني	2	1	0	3		
	PHA344	علم الطفيليات	2	1	0	3			PHA355	صيدلة حيوية	2	0	0	2		
	PHA345	علم المناعة	2	0	0	2			PHA356	مستحضرات التجميل	2	0	0	2		
	PHA354	صيدلانيات (3)	2	1	0	3			PHA362	علم الأدوية (2)	2	1	0	3		
	PHA361	علم الأدوية (1)	2	1	0	3			PHA375	كيمياء عقاقير (2)	2	1	0	3		
	PHA374	كيمياء عقاقير (1)	2	1	0	3			PHA382	صيدلة مستشفيات	2	0	0	2		
		إجمالي الساعات المعتمدة				18				إجمالي الساعات المعتمدة				18		

المستوى الرابع	MED416	طرق بحث واحصاء حيوي	2	0	0	2	PHA458	أنظمة إيصال الدواء	2	0	0	2
	PHA435	كيمياء دوائية (3)	2	1	0	3	PHA459	صيدلة صناعة	2	1	0	3
	PHA446	التقنية الحيوية وعلم الصيدلة الجيني	2	0	0	2	PHA465	علم الأدوية (4)	2	0	0	2
	PHA457	حركية الدواء	2	0	0	2	PHA466	علم السموم	2	0	0	2
	PHA463	علم الأدوية (3)	2	0	0	2	PHA484	صيدلة مجتمع	2	1	0	3
	PHA464	معلومات الدواء	1	0	0	1	PHA485	إدارة وتسويق صيدلاني	2	0	0	2
	PHA476	التداوي بالأعشاب	2	0	0	2	PHA486	علم المداوة (1)	2	1	0	3
	PHA483	الرعاية الصيدلانية	1	1	0	2						
		إجمالي الساعات المعتمدة				16		إجمالي الساعات المعتمدة				17
الصيفي	PHA591	التدريب الصيدلي الميداني (1) (280 (Con. H	0	0	7	7						
المستوى الخامس	PHA536	ضبط الجودة	2	1	0	3	PHA588	علم المداوة (3)	2	1	0	3
	PHA567	علم الدواء الوبائي واليقظة الدوائية	2	0	0	2	PHA589	الاقتصاد الصيدلاني	2	0	0	2
	PHA587	علم المداوة (2)	2	1	0	3	PHA593	التدريب الصيدلي الميداني (3) (200 Co.H)	0	0	5	5
	PHA592	التدريب الصيدلي الميداني (2) (160 Co.H)	0	0	4	4	PHA594	مشروع بحث التخرج	0	2	0	2
		إجمالي الساعات المعتمدة				12		إجمالي الساعات المعتمدة				12

Study Plan Bachelor of Pharmaceutical Sciences (171 Cr.H)

Level	First Semester						Second Semester					
	Course Code	Course Name	Credit Hours				Course Code	Course Name	Credit Hours			
			Th.	Pr.	Tut	Total			Th.	Pr.	Tut	Total
First Year	ARB101	Arabic Language (1)	2	0	0	2	ARB102	Arabic Language (2)	2	0	0	2
	ENG101	English Language (1)	2	0	0	2	ENG102	English Language (2)	2	0	0	2
	ITP101	Computer Skills	2	1	0	3	ISL101	Islamic Culture	2	0	0	2
	COM101	Communication skills	2	0	0	2	PHA122	Anatomy and Histology	2	1	0	3

	MED111	General Biology	2	1	0	3	PHA123	Pharmaceutical Calculations	2	0	0	2
	MED112	General chemistry	2	1	0	3	PHA151	Physical Pharmacy	2	1	0	3
	PHA121	Orientation to Pharmacy	1	0	0	1	PHA171	Pharmaceutical Botany	2	1	0	3
		Total of Credit Hours				**16**		**Total of Credit Hours**				**17**
Second Year	MED213	Microbiology	2	1	0	3	MED215	Analytical Chemistry	2	1	0	3
	MED214	Organic chemistry	2	1	0	3	PHA225	Physiology (2)	2	0	0	2
	PHA224	Physiology (1)	2	0	0	2	PHA231	Pharmaceutical Organic Chemistry	2	1	0	3
	PHA241	Biochemistry (1)	2	0	0	2	PHA242	Biochemistry (2)	2	1	0	3
	PHA252	Pharmaceutics (1)	2	1	0	3	PHA243	Pharmaceutical Microbiology	2	1	0	3
	PHA272	Pharmacognosy (1)	2	1	0	3	PHA253	Pharmaceutics (2)	2	1	0	3
	PHA281	Pharmacy regulations and ethics	2	0	0	2	PHA273	Pharmacognosy (2)	2	1	0	3
		Total of Credit Hours				**18**		**Total of Credit Hours**				**20**
Third Year	PHA326	Pathophysiology	2	0	0	2	PHA333	Medicinal chemistry (2)	2	1	0	3
	PHA332	Medicinal chemistry (1)	2	0	0	2	PHA334	Pharmaceutical instrumental analysis	2	1	0	3
	PHA344	Parasitology	2	1	0	3	PHA355	Biopharmaceutics	2	0	0	2
	PHA345	Immunology	2	0	0	2	PHA356	Cosmetics	2	0	0	2
	PHA354	Pharmaceutics (3)	2	1	0	3	PHA362	Pharmacology (2)	2	1	0	3
	PHA361	Pharmacology (1)	2	1	0	3	PHA375	Phytochemistry (2)	2	1	0	3

	PHA374	Phytochemistry (1)	2	1	0	3		PHA382	Hospital Pharmacy	2	0	0	2
		Total of Credit Hours				18			**Total of Credit Hours**				18
Fourth Year	MED416	Research Methodology and Biostatistics	2	0	0	2		PHA458	Drug Delivery Systems	2	0	0	2
	PHA435	Medicinal chemistry (3)	2	1	0	3		PHA459	Industrial Pharmacy	2	1	0	3
	PHA446	Biotechnology and Pharmacogenomics	2	0	0	2		PHA465	Pharmacology (4)	2	0	0	2
	PHA457	Pharmacokinetics	2	0	0	2		PHA466	Toxicology	2	0	0	2
	PHA463	Pharmacology (3)	2	0	0	2		PHA484	Community Pharmacy	2	1	0	3
	PHA464	Drug Information	1	0	0	1		PHA485	Pharmaceutical Management & Marketing	2	0	0	2
	PHA476	Phytotherapy	2	0	0	2		PHA486	Therapeutics (1)	2	1	0	3
	PHA483	Pharmaceutical Care	1	1	0	2							
		Total of Credit Hours				16			**Total of Credit Hours**				17
Summer training	PHA591	Pharmaceutical Field Training (1) (280 Co. H)	0	0	7	7							
Fifth Year	PHA536	Quality Control	2	1	0	3		PHA588	Therapeutics (3)	2	1	0	3
	PHA567	Pharmacoepidemiology and Pharmacovigilance	2	0	0	2		PHA589	Pharmacoeconomics	2	0	0	2
	PHA587	Therapeutics (2)	2	1	0	3		PHA593	Pharmaceutical Field Training (3) (200 Co. H)	0	0	5	5
	PHA592	Pharmaceutical Field Training (2) (160 Co. H)	0	0	4	4		PHA594	Graduation Project	0	2	0	2
		Total of Credit Hours				12			**Total of Credit Hours**				12

ملخص هيكل الخطة الدراسية للبرنامج

عدد مقررات البرنامج والساعات المعتمدة بحسب الفصل الدراسي ونوع المتطلب

المستوى Level	الفصل Semester	عدد المقررات NO of Courses	متطلبات جامعة U R	متطلبات كلية F R	متطلبات برنامج P R	اجمالي الساعات المعتمدة Total C.H	
الأول First	الأول	7	9	6	1	16	33
	الثاني	7	6	0	11	17	
الثاني Second	الأول	7	0	6	12	18	38
	الثاني	7	0	3	17	20	
الثالث Third	الأول	7	0	0	18	18	36
	الثاني	7	0	0	18	18	
الرابع Fourth	الأول	8	0	2	14	16	33
	الثاني	7	0	0	17	17	
	صيفي	1	0	0	7	7	7
الخامس Fifth	الأول	4	0	0	12	12	24
	الثاني	4	0	0	12	12	
الإجمالي		66	15	17	139	171	171
الوزن النسبي %			8.77%	9.94%	81.29%	100%	

عدد مقررات البرنامج بحسب نوع المتطلب

المستوى Level	الفصل Semester	متطلبات جامعة U R	متطلبات كلية F R	متطلبات برنامج P R	اجمالي المقررات
الأول First	الأول	4	2	1	7
	الثاني	3	0	4	7
الثاني Second	الأول	0	2	5	7
	الثاني	0	1	6	7
الثالث Third	الأول	0	0	7	7
	الثاني	0	0	7	7
الرابع Fourth	الأول	0	1	7	8
	الثاني	0	0	7	7
	صيفي	0	0	1	1
الخامس Fifth	الأول	0	0	4	4
	الثاني	0	0	4	4
	الإجمالي	7	6	53	66

هيكل متطلبات البرنامج

الوزن النسبي Rational Weight %	الساعات المعتمدة Credit Hours	عدد المقررات NO of Courses	Requirements المتطلبات
8.772%	15	7	1- متطلبات جامعة (UR) University Requirements
9.942%	17	6	2- متطلبات كلية (FR) Faculty Requirements
81.287%	139	53	3- متطلبات برنامج (PR) Program Requirements
% 100	171	66	Total Cr. Hours إجمالي الساعات المعتمدة

ملخص بالنسبة المئوية للساعات المعتمدة لمتطلبات هيكل البرنامج وفقا لطبيعتها (نظري/ عملي/ تمارين)

النسبة %	Credit Hours الساعات المعتمدة				متطلبات هيكل البرنامج
	لاجمالي Total C.H	تمارين Tut	عملي Pr	نظري Th	
8.77%	15	0	1	14	متطلبات الجامعة U R
9.94%	17	0	5	12	متطلبات الكلية F R
81.29%	139	16	28	95	متطلبات البرنامج P R
100%	171	16	34	121	إجمالي الساعات المعتمدة للبرنامج Total C.H
100%		9.36%	19.88%	70.76%	النسبة Percentage %

First Level, First Semester

Course Specification of Arabic Language1

I. نموذج توصيف مقرر:اللغة العربية (101)	
الجامعة: جامعة السعيد	**الكلية:** كل كليات الجامعة
القســم: كل أقسام الجامعة - متطلب جامعة	**البرنامج:** كل برامج الجامعة-متطلب جامعة

I. معلومات عامة عن المقرر:						
.1	اسم المقرر:	Arabic Language I				
.2	رمز المقرر ورقمه:	ARB 101				
.3	الساعات المعتمدة:	محاضرة	سمنار	عملي	تدريب	الإجمالي
		2	-	-	-	2
.4	المستوى والفصل الدراسي:	المستوى الأول- الفصل الأول				
.5	المتطلبات السابقة لدراسة المقرر(إن وجدت):	لا يوجد				
.6	المتطلبات المصاحبة (إن وجدت):	لا يوجد				
.7	البرنامج الذي يدرس له المقرر:	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
.8	لغة تدريس المقرر:	اللغة العربية				
.9	نظام الدراسة:	فصلي				
.10	معدّا مواصفات المقرر:	د. أحمد عثمان ناجي المخلافي د. جلال الحمادي				

II. وصف المقرر:
يتناول هذا المقرّر بعض المهارات الكتابية، وأقسام الكلمة في اللغة العربية، والمبني والمعرب، وأنواع الجمع، وما يُعرب بعلامات الإعراب الفرعية، والمنقوص والمقصور، وكيفية التثنية والجمع، والفعل المضارع المعرب، والأحكام الإعرابية لركني الجملة الاسمية، والأفعالَ الناسخةَ (دلالاتها وعملها)، وذلك بواسطة التطبيقات اللغوية

كتابةً ونطقًا، كما يتناول نصوصًا أدبية راقية من القرآن الكريم ومن شعرنا العربي القديم تعكس جمال اللغة العربية تعبيرًا وتصويرًا وبلاغةً، يتدرب الطالب على تحليلها وتذوقها. وذلك سيعًا إلى تنمية قدرات الطالب المهارية الكتابية واللغوية والبلاغية، وتطبيقها في أثناء دراسته الجامعية وفي حياته العملية. هذا ويُعدُّ مُقرَّرُ اللغة العربية (101) متطلبًا جامعيًّا لجميع طلبة جامعة السعيد والجامعات اليمنية الأخرى، وهو أيضًا مقرر قبليٌّ لمقرر اللغة العربية (102).

III. أهداف المقرر:

يهدف هذا المقرر إلى:

- تنمية الطالب مهاراته الكتابة واللغوية والبلاغية التي اكتسبها في مرحلة التعليم الأساسي والثانوي، ليتمكن من أداء عبارة سليمة من الأخطاء الكتابية والنحوية والصرفية والأسلوبية.
- رفع القدرات التعبيرية والكتابية للطالب، وزيادة ثروته اللغوية، ومساعدته على استخدام العبارة المناسبة نطقًا وكتابةً في شكل دلالي واضح.
- تدريب الطالب على التحدّث، والترتيب المنطقي للأفكار، مع الحرص على الالتزام باللغة العربية الفصحى.
- معرفة الطالب بأقسام الكلمة، وعلامات كل قسم، وبعلامات الإعراب، وبالمبني والمعرب، وبأنواع الاسم من حيث الإفراد والتذكير والتأنيث والتثنية والجمع.
- بيان الطالب الأحكام الإعرابية المتعلقة بالأسماء المعربة بعلامة إعراب فرعية، وبالفعل المضارع المعرب، والمبتدأ والخبر والأفعال الناسخة.
- تمكين الطالب من إنشاء جمل اسمية صحيحة وأن يُدخل عليها الأفعال الناسخة مراعيًا التغيير بعد دخول الناسخ.
- تمكين الطالب القدرة على التحليل اللغوي والبلاغي للنصوص الأدبية، وتبيين مواضع الجمال فيها.
- اكتساب الطالب اتجاهات إيجابية نحو استخدام القواعد الكتابية والنحوية والصرفية وتطبيقها في حياته العملية.

IV. مخرجات التعلم:

(A) المعرفة والفهم

موائمة مخرجات تعلم المقرر مع مخرجات تعلم البرنامج		
مخرجات تعلم البرنامج (المعرفة والفهم)	مخرجات تعلم المقرر (المعرفة والفهم)	
بعد الانتهاء من البرنامج، سيكون الخريجون قادرا على أن:		
A1	يوضيح المعرب والمبني، والمثنى والجمع، والأسماء الخمسة والمقصور والمنقوص والممدود، والممنوع من الصرف، والفعل المضارع المعرب، والمبتدأ والخبر، والأفعال الناسخة. وفهم الأحكام الإعرابية لهذه الأسماء والأفعال.	a.1
	يظهر المعرفة **والفهم** للقواعد الكتابية لكل من: الهمزة، الألف اللينة، والهاء والتاء المربوطة والمبسوطة، والحروف التي تكتب ولا تنطق، والتي تنطق ولا تكتب، وعلامات الترقيم.	a.2
	يتعرف على النصوص الأدبية الجديدة، وبشعرائها، **ويفهم** مضامينها ومواضع الجمال الفني فيها.	a.3

(B) المهارات الذهنية		
موائمة مخرجات تعلم المقرر مع مخرجات تعلم البرنامج		
مخرجات تعلم المقرر (المهارات الذهنية)		
بعد الانتهاء من البرنامج، سيكون الخريجون قادرين على أن:		
B3	يميز بين كلٍّ من: الاسم والفعل والحرف- المصروف والممنوع من الصرف- أقسام الاسم- المبني والمعرب، علامات الإعراب الأصلية والفرعية- المبتدأ والخبر- واسم الفعل الناسخ وخبره.	b.1
	يربط بين القواعد النحوية ومهارة الكتابة السليمة للهمزات- والألف المقصورة والياء والألف المقصورة والألف الطويلة، والضاد والظاء، واستخدام علامات الترقيم استخدامًا صحيحًا.	b.2

(C) المهارات المهنية والعملية:		
موائمة مخرجات تعلم المقرر مع مخرجات تعلم البرنامج		
مخرجات تعلم المقرر (المهارات المهنية والعملية)		
بعد الانتهاء من المقرر، سيكون الطالب قادرا على أن:		
C4	يكتب الأبحاث والتقارير والرسائل والتلخيصات كتابة صحيحة لغةً ورسمًا.	c.1
	يصحح الأخطاء الكتابية واللغوية والأسلوبية والأخطاء اللغوية الشائعة.	c.2

(D) المهارات العامة		
موائمة مخرجات تعلم المقرر مع مخرجات تعلم البرنامج		
مخرجات تعلم البرنامج (المهارات العامة)		
بعد الانتهاء من البرنامج، سيكون الطالب قادرا على أن:		
D1	يتواصل كتابيا وشفويا مع الآخرين في صورة سليمة.	d.1
D3	يزود المجتمع بالمعطيات الفكرية والحضارية لأمته (التراثية والمعاصرة) ليكون دارسًا مستنيرًا يُقدِّر تراثه، وينمو عنده شعوره بالاعتزاز بلغته العربية.	d.2

V. ربط مخرجات التعلم باستراتيجيات التدريس والتقييم

أولا: ربط مخرجات تعلم المقرر (المعرفة والفهم) باستراتيجية التدريس والتقييم:

مخرجات المقرر / المعرفة والفهم	استراتيجية التدريس	استراتيجية التقويم
a1 - يوضيح المعرب والمبني، والمثنى والجمع، والأسماء الخمسة والمقصور والمنقوص والممدود، والممنوع من الصرف، والفعل المضارع المعرب، والمبتدأ والخبر، والأفعال الناسخة. وفهم الأحكام الإعرابية لهذه الأسماء والأفعال.	المحاضرة المناقشة والحوار حل المشكلات	الاختبارات التحريرية- الأسئلة المباشرة- الإجابة عن التطبيقات النحوية- تقييم التكاليف المنزلية- المشاركة في أثناء المحاضرة.
a2- يظهر المعرفة والفهم للقواعد الكتابية لكل من: الهمزة، الألف اللينة،	المحاضرات- حل المشكلات المناقشة والحوار- التطبيقات العملية.	الاختبارات التحريرية- تقييم الواجبات المنزلية- المشاركة- الأسئلة المباشرة، التطبيقات الكتابية.

والهاء والتاء المربوطة والمبسوطة، والحروف التي تكتب ولا تنطق، والتي تنطق ولا تكتب، وعلامات الترقيم.		
a3– يتعرف على النصوص الأدبية الجديدة، وبشعرائها، ويفهم مضامينها ومواضع الجمال الفني فيها.	المحاضرة - الحوار والمناقشة- التطبيقات العملية.	الاختبارات التحريرية والشفوية - المشاركة (في أثناء المحاضرة).

ثانيا: ربط مخرجات تعلم المقرر (المهارات الذهنية) باستراتيجية التدريس والتقييم:		
مخرجات المقرر/ المهارات الذهنية	استراتيجية التدريس	استراتيجية التقويم
b1– يميز بين كلٍّ من: الاسم والفعل والحرف- المصروف والممنوع من الصرف- أقسام الاسم- المبني والمعرب، علامات الإعراب الأصلية والفرعية- المبتدأ والخبر- واسم الفعل الناسخ وخبره.	المحاضرة – العروض الإيضاحية - حل المشكلات الحوار والمناقشة- التطبيقات العملية	الاختبارات التحريرية والشفوية- الملاحظة الواجبات المنزلية – المشاركة (في أثناء المحاضرة).
b2- يربط بين القواعد النحوية ومهارة الكتابة السليمة للهمزات- والألف المقصورة والياء والألف المقصورة والألف الطويلة، والضاد والظاء، واستخدام علامات الترقيم استخدامًا صحيحًا.صنيف علامات إعراب الفعل المضارع والمبتدأ والخبر، واسم الفعل الناسخ وخبره.	المحاضرة- المناقشة والحوار- التطبيقات العملية.	الملاحظة- الاختبارات التحريرية والشفوية- حل التدريبات – التكاليف الصغيرة.

ثالثا: ربط مخرجات تعلم المقرر (المهارات المهنية والعملية) باستراتيجية التدريس والتقييم:		
مخرجات المقرر/ المهارات المهنية والعملية	استراتيجية التدريس	استراتيجية التقويم
c1– يكتب الأبحاث والتقارير والرسائل والتلخيصات كتابة صحيحة لغةً ورسمًا.	الحوار والمناقشة- التطبيقات العملية - التعلّم الذاتي.	المشاركة- تقييم التكاليف.
c2– يصحح الأخطاء الكتابية واللغوية والأسلوبية والأخطاء اللغوية الشائعة.	حل المشكلات- الحوار والمناقشة.	المشاركة والاختبارات التحريرية والشفوية.

رابعا: ربط مخرجات تعلم المقرر (المهارات العامة) باستراتيجية التدريس والتقييم:		
مخرجات المقرر	استراتيجية التدريس	استراتيجية التقويم
d1–التواصل الكتابي والشفوي مع الآخرين في صورة سليمة.	المحاضرة – الحوار والمناقشة – التطبيقات العملية.	الاختبارات التحريرية والشفوية– الملاحظة المباشرة.
d2–يزود المجتمع بالمعطيات الفكرية والحضارية لأمته (التراثية والمعاصرة) ليكون دارسًا مستنيرًا يُقدِّر تراثه، وينمو عنده شعوره بالاعتزاز بلغته العربية.	المحاضرة – الحوار والمناقشة – التطبيقات العملية.	الملاحظة- الاختبارات التحريرية والشفوية- التطبيقات في أثناء المحاضرة

VI. كتابة مواضيع المقرر الرئيسة والفرعية (النظرية والعملية) وربطها بمخرجات التعلم المقصودة للمقرر مع تحديد الساعات المعتمدة لها.

كتابة وحدات /مواضيع محتوى المقرر

ألجانب النظري

الرقم	وحدات/ موضوعات المقرر	المواضيع التفصيلية	عدد الأسابيع	الساعات الفعلية	مخرجات تعلم المقرر
1	المقدّمة (أهمية اللغة العربية) + أقسام الكلام	الاسم، الفعل، الحرف وعلامات كل منها - الاسم من حيث: التذكير والتأنيث وعلامات التأنيث، وأقسام المؤنث. –الاسم المقصور والمنقوص. - أقسام الفعل. *فوائد لغوية متنوعة في آخر كل محاضرة.	2	4	a1, a2,a3,b1,b2
2	المبني والمعرب وما يُعرب بعلامات الإعراب الفرعية	الفرق بين البناء والإعراب ما يُعرب بعلامات الإعراب الفرعية: المثنى وما يُلحق به. جمع المذكر السالم وما يلحق به- جمع المؤنث السالم- الأسماء الخمسة- الممنوع من الصرف- الأفعال الخمسة	2	4	a1, a2,a3,b1,b2
3	الفعل المضارع المعرب	المضارع المرفوع وعلامات رفعه. - المضارع المنصوب وعلامات نصبه ونواصبه - المضارع المجزوم وعلامات جزمه: ما يجزم فعلا واحدًا. ما يجزم فعلين،	2	4	a1,a2,a3,b1,b2,c1,c2
4	بعض المهارات الكتابية + اختبار نصف الفصل الدراسي	كتابة الضاد والظاء، وكتابة والهاء التي تقع في آخر الكلمة والتاء المربوطة والمبسوطة	1	2	a1,a2,a3,b1,b2,c1,c2
5	نص قرآني	من سورة الحجرات (من آية 6- 13) دراسة لغوية وتطبيقية.	1	2	a1,a2,a3,b1,b2,c1,c2

6	الجملة الاسمية	المبتدأ والخبر وأحكامهما- صور المبتدأ مواضع الابتداء بالنكرة –أنواع الخبر- التقديم والتأخير لركني الاسمية.	1	2	a1,a2,a3,b1,b2,c1,c2,d1,d2
7	الأفعال الناسخة	(كان) وأخواتها و(كاد) وأخواتها دلالاتها وعملها، والفرق بين خبر(كان) وأخواتها وخبر(كاد) وأخواتها	1	2	a1,a2,a3,b1,b2,c1,c2,d1,d2
	نص شعري من عصر صدر الإسلام.	من قصيدة أبي ذؤيب - الهُذلي في رثاء أبنائه يقتصر على مطلعها (18) بيتًا دراسة بلاغية تحليلية وتطبيقية.	1	2	a1,a2,a3,b1,b2,c1,c2
7	القواعد الكتابية	قواعد كتابة الهمزة: الأولية (الوصل والقطع) والمتوسطة والمتطرفة -الألف الليّنة (قواعد كتابتها) –الحروف التي تنطق ولا تكتب، والتي تكتب ولا تنطق. -علامات الترقيم.	2	2	a1,a2,a3,b1,b2,c1,c2,d1,d2
8	نص شعري من العصر العباسي الثاني.	من قصيدة (في الفخر والشكوى) للشريف الرضي دراسة بلاغية وتذوقيّة ولغوية تحليلية. -	1	2	a1,a2,a3,b1,b2,c1,c2,d1,d2
إجمالي الأسابيع والساعات			14	28	

استراتيجية التدريس:
المحاضرة .
المناقشة والحوار.
التعلُّم التعاوني .
حل المشكلات .
العروض الإيضاحية
التعلم الذاتي
التطبيقات العملية.

الأنشطة والتكليفات:				
الرقم	النشاط / التكليف	مخرجات التعلم	الأسبوع	الدرجة
1	قراءة آيات معيّنة من القرآن الكريم واستخراج الأفعال وإعرابها.	a1,a2,a3,b1,b2,c1,c2,d1,d2	7	5
2	حل التدريبات النحوية	a1,a2,a3,b1,b2,c1,c2,d1,d2	14-1	-
3	حل التدريبات الكتابية	a1,a2,a3,b1,b2,c1,c2,d1,d2	14	5
4	بعد إرشاد الطالب إلى عدد من كتب التصويبات اللغوية يُكلف كل واحد منهما باستخراج من10 إلى20 خطأ شائعًا مع ذكر الصواب.	a1,a2,a3,b1,b2,c1,c2,d1,d2	4	5

تقييم التعلم:					
الرقم	أنشطة التقييم	الأسبوع	الدرجة	نسبة الدرجة إلى درجة التقويم النهائي	المخرجات التي يحققها
1	تمارين عملية – حل التمرينات- واجبات.	1-14	-	-	a1,a2,a3,b1,b2,c1,c2
2	التكاليف المنزلية.	4,7,14	15	%15	a1,a2,a3,b1,b2,c1,c2
3	اختبار نصف الفصل الدراسي.	7	15	%15	a1,a2,a3,b1,b2,c1,c2,d1,d2
5	اختبار آخر الفصل الدراسي.	16	70	%70	a1,a2,a3,b1,b2,c1,c2,d1,d2

مصادر التعلم:
(اسم المؤلف، سنة النشر، اسم الكتاب، دار النشر، بلد النشر).
المراجع الرئيسة: (لا تزيد عن مرجعين)
د.علي المخلافي وآخرون- 2004-اللغة العربية (101) و(102) مكتبة الجيل الجديد - صنعاء د.محمد حماسة عبداللطيف وآخران-1997م النحو الأساسي – دار الفكر العربي- القاهرة
المراجع المساعدة
السيد أحمد الهاشمي – (ت.ذ.ط). المفرد العلم في رسم القلم – دار الكتب العلمية- بيروت محمد العدناني -1998 –ط. الثانية- معجم الأغلاط اللغوية المعاصرة- مكتبة لبنان – بيروت. د.محمود سليمان ياقوت-2012-ط1- أسس اللغة العربية لطلاب الجامعات-دار عباد الرحمن-القاهرة ودار ابن حزم-بيروت.
مواد إلكترونية وإنترنت: (إن وجدت)
1. كتب إلكترونية كمعجم المعاني عربي عربي. 2. المكتبة الشاملة 3. مواقع لغوية، كموقع الألوكة، ومكتبة المصطفى، وموقع اللغة العربية تعلمًا وتعليمًا، وعجائب من العربية، وفنون اللغة العربية، ومقهى اللغة العربية.

I.	Course Policies:
1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects**: - Assignments and projects will be assessed individually unless the teacher request for group work
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the faculty rules.
7	**Other policies**:

Template for Course Plan (Syllabus) Arabic Language (I)

I. معلومات عن مدرس المقرر:						
الاسم		الساعات المكتبية (2/ أسبوعيا)				
المكان ورقم الهاتف		السبت	الأحد	الاثنين	الثلاثاء	الأربعاء	الخميس
البريد الإلكتروني							

II. معلومات عامة عن المقرر:						
1	اسم المقرر:	Arabic Language I				
2	رمز المقرر ورقمه:	ARB 101				
3	الساعات المعتمدة للمقرر:	الساعات				المجموع
		نظري	سمنار	عملي	تدريب	
		2				2
4	المستوى والفصل الدراسي:	المستوى الأول – الفصل الاول				
5	المتطلبات السابقة لدراسة المقرر(إن وجدت):	لا يوجد				
6	المتطلبات المصاحبة لدراسة المقرر(إن وجدت):	لا يوجد				
7	البرنامج/ البرامج التي يتم فيها تدريس المقرر:	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	لغة تدريس المقرر:	اللغة العربية				
9	مكان تدريس المقرر:	جامعة السعيد				

III. وصف المقرر الدراسي:
يتناول هذا المقرّر بعض المهارات الكتابية، وأقسام الكلمة في اللغة العربية، والمبني والمعرب، وأنواع الجمع، وما يُعرب بعلامات الإعراب الفرعية، والمنقوص والمقصور، وكيفية التثنية والجمع، والفعل المضارع المعرب، والأحكام الإعرابية لركني الجملة الاسمية، والأفعالَ الناسخةَ (دلالاتها وعملها)، وذلك بواسطة التطبيقات اللغوية كتابةً ونطقًا، كما يتناول نصوصًا أدبية راقية من القرآن الكريم ومن شعرنا العربي القديم تعكس جمال اللغة العربية تعبيرًا وتصويرًا وبلاغةً، يتدرب الطالب على تحليلها وتذوقها. وذلك سيعًا إلى تنمية قدرات الطالب المهارية الكتابية واللغوية والبلاغية، وتطبيقها في أثناء دراسته الجامعية وفي حياته العملية. هذا ويُعدُّ مُقرَّرُ اللغة

العربية (101) متطلبًا جامعيًّا لجميع طلبة جامعة السعيد والجامعات اليمنية الأخرى، وهو أيضًا مقرر قبليٌّ لمقرر اللغة العربية (102).

IV .أهداف المقرر:

يهدف هذا المقرر إلى:

- تنمية الطالب مهاراته الكتابة واللغوية والبلاغية التي اكتسبها في مرحلة التعليم الأساسي والثانوي، ليتمكن من أداء عبارة سليمة من الأخطاء الكتابية والنحوية والصرفية والأسلوبية.
- رفع القدرات التعبيرية والكتابية للطالب، وزيادة ثروته اللغوية، ومساعدته على استخدام العبارة المناسبة نطقًا وكتابةً في شكل دلالي واضح.
- تدريب الطالب على التحدّث، والترتيب المنطقي للأفكار، مع الحرص على الالتزام باللغة العربية الفصحى.
- معرفة الطالب بأقسام الكلمة، وعلامات كل قسم، وبعلامات الإعراب، وبالمبني والمعرب، وبأنواع الاسم من حيث الإفراد والتذكير والتأنيث والتثنية والجمع.
- بيان الطالب الأحكام الإعرابية المتعلقة بالأسماء المعربة بعلامة إعراب فرعية، وبالفعل المضارع المعرب، والمبتدأ والخبر والأفعال الناسخة.
- تمكين الطالب من إنشاء جمل اسمية صحيحة وأن يُدخل عليها الأفعال الناسخة مراعيًا التغيير بعد دخول الناسخ.
- تمكين الطالب القدرة على التحليل اللغوي والبلاغي للنصوص الأدبية، وتبيين مواضع الجمال فيها.
- اكتساب الطالب اتجاهات إيجابية نحو استخدام القواعد الكتابية والنحوية والصرفية وتطبيقها في حياته العملية.

V .مخرجات التعلم المقصودة للمقرر:

بعد الانتهاء من المقرر، سيكون الطالب قادرا على أن:

- 1يوضيح المعرب والمبني، والمثنى والجمع، والأسماء الخمسة والمقصور والمنقوص والممدود، والممنوع من الصرف، والفعل المضارع المعرب، والمبتدأ والخبر، والأفعال الناسخة. وفهم الأحكام الإعرابية لهذه الأسماء والأفعال .
- يظهر المعرفة والفهم للقواعد الكتابية لكل من: الهمزة، الألف اللينة، والهاء والتاء المربوطة والمبسوطة، والحروف التي تكتب ولا تنطق، والتي تنطق ولا تكتب، وعلامات الترقيم.
- يتعرف على النصوص الأدبية الجديدة، وبشعرائها، ويفهم مضامينها ومواضع الجمال الفني فيها.
- يميز بين كلٍّ من: الاسم والفعل والحرف- المصروف والممنوع من الصرف- أقسام الاسم- المبني والمعرب، علامات الإعراب الأصلية والفرعية- المبتدأ والخبر- واسم الفعل الناسخ وخبره.
- يربط بين القواعد النحوية ومهارة الكتابة السليمة للهمزات- والألف المقصورة والياء والألف المقصورة والألف الطويلة، والضاد والظاء، واستخدام علامات الترقيم استخدامًا صحيحًا. صنيف علامات إعراب الفعل المضارع والمبتدأ والخبر، واسم الفعل الناسخ وخبره.
- يكتب الأبحاث والتقارير والرسائل والتلخيصات كتابة صحيحة لغةً ورسمًا.
- يصحح الأخطاء الكتابية واللغوية والأسلوبية والأخطاء اللغوية الشائعة.
- يتواصل كتابيا وشفويا مع الآخرين في صورة سليمة.
- يزود المجتمع بالمعطيات الفكرية والحضارية لأمته (التراثية والمعاصرة) ليكون دارسًا مستنيرًا يُقدِّر تراثه، وينمو عنده شعوره بالاعتزاز بلغته العربية.

VI. محتوى المقرر:

A .الجانب النظري:

الرقم	وحدات المقرر	المواضيع التفصيلية	الأسبوع	الساعات الفعلية
1	المقدّمة (أهمية اللغة العربية) + أقسام الكلام.	الاسم، الفعل، الحرف، وعلامات كل منها - الاسم من حيث: التذكير والتأنيث وعلامات التأنيث، وأقسام المؤنث. – الاسم المقصور والمنقوص. - أقسام الفعل. *فوائد لغوية متنوعة في آخر كل محاضرة.	2	4
2	المبني والمعرب وما يُعرب بعلامات الإعراب الفرعية	الفرق بين البناء والإعراب ما يُعرب بعلامات الإعراب الفرعية: المثنى وما يُلحق به. جمع المذكر السالم وما يلحق به- جمع المؤنث السالم- الأسماء الخمسة- الممنوع من الصرف- الأفعال الخمسة	2	4
3	الفعل المضارع المعرب	المضارع المرفوع وعلامات رفعه. - المضارع المنصوب وعلامات نصبه ونواصبه - المضارع المجزوم وعلامات جزمه: ما يجزم فعلا واحدًا. ما يجزم فعلين،	2	4
4	يعض المهارات الكتابية + اختبار نصف الفصل الدراسي	كتابة الضاد والظاء، وكتابة والهاء التي تقع في آخر الكلمة والتاء المربوطة والمبسوطة	1	2
5	نص قرآني	من سورة الحجرات (من آية 6-13) دراسة لغوية وتطبيقية.	1	2
6	الجملة الاسمية	المبتدأ والخبر وأحكامهما-صور المبتدأ مواضع الابتداء بالنكرة – أنواع الخبر- التقديم والتأخير لركني الاسمية.	1	2
7	الأفعال الناسخة	(كان) وأخواتها و(كاد) وأخواتها دلالاتها وعملها، والفرق بين خبر(كان) وأخواتها وخبر(كاد) وأخواتها	1	2
8	نص شعري من عصر صدر الإسلام.	من قصيدة أبي ذؤيب الهُذلي في - رثاء أبنائه يقتصر على مطلعها (18) بيتًا دراسة بلاغية تحليلية وتطبيقية.	1	2
9	القواعد الكتابية	قواعد كتابة الهمزة: الأولية (الوصل	2	4

		والقطع) والمتوسطة والمتطرفة. -الألف الليّنة (قواعد كتابتها) – الحروف التي تنطق ولا تكتب، والتي تكتب ولا تنطق. -علامات الترقيم.		
10	نص شعري من العصر العباسي	من قصيدة (في الفخر والشكوى) للشريف الرضي دراسة بلاغية ولغوية تحليلية. وتذوقيّة -	1	2
	إجمالي عدد الأسابيع والساعات		14	28

B. الجانب العملي:			
كتابة تجارب (مواضيع / مهام) النشاط العملي			
الرقم	المهام / التجارب العملية	عدد الأسابيع	الساعات الفعلية
إجمالي الأسابيع والساعات			

VII. استراتيجية التدريس:
المحاضرة .
المناقشة والحوار.
التعلُّم التعاوني .
حل المشكلات .
العروض الإيضاحية
التعلم الذاتي
التطبيقات العملية.

VIII . الأنشطة والتكليفات:			
الرقم	النشاط/ التكليف	الأسبوع	الدرجة (إن وجدت)
1	قراءة آيات معيّنة من القرآن الكريم واستخراج الأفعال وإعرابها .	7	5
2	حل التدريبات النحوية	1-14	-

3	حل التدريبات الكتابية	14	5
4	بعد إرشاد الطالب إلى عدد من كتب التصويبات اللغوية يُكلف كل واحد منهما باستخراج من10 إلى20 خطأ شائعًا مع ذكر الصواب.	4	5

IX.تقييم التعلم:

الرقم	موضوعات التقويم	موعد التقويم/ اليوم والتاريخ	الدرجة	الوزن النسبي (نسبة الدرجة إلى درجة التقويم النهائي)
.1	تمارين عملية – حل التمرينات-واجبات.	1-14	-	-
.2	التكاليف المنزلية.	4,7,14	15	%15
.3	اختبار نصف الفصل الدراسي.	7	15	%15
.4	اختبار آخر الفصل الدراسي.		70	%70

X .مصادر التعلم:

(اسم المؤلف، سنة النشر، اسم الكتاب، دار النشر، بلد النشر).

المراجع الرئيسة: (لا تزيد عن مرجعين) 1.

د. علي المخلافي وآخرون- 2004-اللغة العربية (101) و(102) مكتبة الجيل الجديد - صنعاء
د.محمد حماسة عبداللطيف وآخران-1997م النحو الأساسي – دار الفكر العربي- القاهرة

المراجع المساعدة2 .

السيد أحمد الهاشمي – (ت.ذ.ط). المفرد العلم في رسم القلم – دار الكتب العلمية- بيروت
محمد العدناني -1998 –ط. الثانية- معجم الأغلاط اللغوية المعاصرة- مكتبة لبنان – بيروت.
د. محمود سليمان ياقوت-2012-ط1- أسس اللغة العربية لطلاب الجامعات-دار عباد الرحمن-القاهرة ودار ابن حزم-بيروت.

3.مواد إلكترونية وإنترنت: (إن وجدت)

1- كتب إلكترونية كمعجم المعاني عربي عربي.
2- المكتبة الشاملة.
3 - مواقع لغوية، كموقع الألوكة، ومكتبة المصطفى، وموقع اللغة العربية تعلمًا وتعليمًا، وعجائب من العربية، وفنون اللغة العربية، ومقهى اللغة العربية.

XI.	Course Policies:
1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam.
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.

4	**Assignments & Projects:** - Assignments and projects will be assessed individually unless the teacher request for group work.
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course.
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:**

Course Specification of English Language1

I. Course Identification and General Information:

1	**Course Title:**	**English Language1**				
2	**Course Code & Number:**	**ENG 101**				
3	**Credit hours:**	C.H				TOTAL
		Th.	Seminar	practical	Training.	
		2				2
4	**Study level/ semester at which this course is offered:**	First Level, First Semester				
5	**Pre –requisite (if any):**	none				
6	**Co –requisite (if any):**					
7	**Program (s) in which the course is offered:**	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	**Language of teaching the course:**	English				
9	**Study System**	Semester				
10	**Mode of delivery:**	Regular				
11	**Location of teaching the course:**	Faculty of medical and Health sciences, Al-Saeed University				
12	**Prepared By:**					

II. Course Description:

It aims at familiarizing the students with the basic skills of the English language. It also provides the students with the help they need to start writing correct sentences and well-formed paragraphs.

III. Course Objectives:

By the end of the course students would be able to:
1-Identify and use basic grammar elements like parts of speech, tenses, subject-verb agreement and punctuation to produce correct sentences.
2- Use their knowledge of language in language communication (written and oral).

IV.	Course Intended learning outcomes (CILOs) of the course	WRITE Symbol and number of PILOs
a.1	Know the correct use and structure of different parts of speech (nouns, pronouns, verbs, adverbs, adjectives, and prepositions	

a.2	Understand the structure and use of the present simple tense, past simple tense, present continuous tense, and past continuous tense	A1
a.3	Identify subject-verb agreement, and punctuation and their use in context.	
b.1	Examine the correct use of parts of speech (nouns, pronouns, verbs, adverbs, adjectives, prepositions).	B3
b.2	-Explore the structure and use of the present simple tense, past simple tense, present continuous tense, and past continuous tense.	
c.2	Construct sentences with correct parts of speech, tense, subject-verb agreement and punctuation	C4
c.2	Edit sentences' subject-verb agreement and punctuation their applications in context	
d.1	Communicate effectively and accurately in English orally and in writing independently	D1
d.2	Assess the requirements of research and resources of Information related to drug discovery, development of pharmaceutical products and pharmaceutical-care practice.	D3

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1- Know the correct use and structure of different parts of speech (nouns, pronouns, verbs, adverbs, adjectives, and prepositions	Lectures	Quizzes
a2- Understand the structure and use of the present simple tense, past simple tense, present continuous tense, and past continuous tense	Class discussions	Homework

a3- Identify subject-verb agreement, and punctuation and their use in context.	In-class	Mid-Exam

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1- Examine the correct use of parts of speech (nouns, pronouns, verbs, adverbs, adjectives, prepositions).	Lectures	Quizzes Written test
b2- Explore the structure and use of the present simple tense, past simple tense, present continuous tense, and past continuous tense.	Class discussions, collaborative and individual practice as well as group work Practice thoroughly in order to produce grammatically correct sentences	

(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1- Construct sentences with correct parts of speech, tense, subject-verb agreement and punctuation	Assigning reading assignments to students prior to lectures	Active class participation reflects the student's willingness to learn with a positive attitude towards the course.
c2- Edit sentences' subject-verb agreement and punctuation their applications in context	Individual counseling on areas of concern to the students	Performance on midterm, term papers, and final exam are evidence of the student's ability to recollect and synthesize information

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1- Communicate effectively and accurately in English orally and in writing independently	1.Classroom discussion	1.performance on oral exams
d2- Assess the requirements of research and resources of Information related to	2.Group work 3.Enhancing self-study	2.Performance on written exams and quizzes

drug discovery, development of pharmaceutical products and pharmaceutical-care practice.		

V. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	contact hours
1	Introduction to the course -Checking students' background in English	a1, b1, c1, d1,d2	Listing the topics, they will be taught -Introduction to the nature of the course -Discussion of code of conduct, and course policy	1	2
2	-Nouns	a1, b1, c1, d1,d2	-Countable and uncountable nouns - 's or of - Compound nouns	1	2
3	-Pronouns	a2, b1, c1, d1,d2	Subject pronouns, -object pronouns, -possessive pro, -possessive adj, - -reflexive pronouns	1	2
4	Adjectives	a1,a,2, b1,b2, c1, d1,d2	- Adjective degrees - Making comparisons, - Superlative and - Comparative degrees	1	2
5	Adverbs	a1,a,2, b1,b2, c1, d1,d2	-Adverb forms - Adverbs describing actions - Adverbs answering the questions: why, how, when, and where - Irregular adverbs -Frequency adverb	1	2
6	Verbs	a1,a,2, b1,b2, c1, d1,d2	- Verb to be - Main verb -Helping verbs -Regular and irregular verbs	1	2

7	Mid-Term Exam	a1,a,2,a3, b1,b2, c1, d1,d2		1	2
8	Present simple + present continuous	a1,a,2,a3, b1,b2, c1,c2, d1,d2	-structure -markers -agreement -uses	1	2
9	-Past simple + Past continuous	a1,a,2,a3, b1,b2, c1,c2, d1,d2	-structure -markers -agreement -uses	1	3
10	Future time Introduction to punctuation	a1,a,2,a3, b1,b2, c1,c2, d1,d2	structure -markers -agreement -use -types of punctuation markers -importance of punctuation	1	2
11	Comma, Semicolon, Capital letters , colon	a3, b1,b2, c1,c2, d1,d2	uses of comma and semicolon -Uses of capital letter and colon	1	2
12	Revision and practice	a1, a2, a3, b1,b2, c1,c2, d1,d2	Write sentences in different tenses -Correct agreement and punctuation in given sentences and paragraphs	1	2
13	Final Exam	a1, a2, a3, b1, b2, c1, c2, d1, d2		1	2
Number of Weeks /and Units Per Semester				**13**	**26 hrs**

B - Practical Aspect: (if any)

Order	Tasks/ Experiments	Number of Weeks	contact hours	Learning Outcomes
1				
2				
Number of Weeks /and Units Per Semester				

VI. Teaching strategies of the course:

1-Lectures

2-Class discussions and collaborative and individual practice as well as group work

3- Direct instruction on helpful cognitive strategies such as analyzing sentences, recognizing relationships and patterns, practicing, reasoning, summarizing, grouping, and associating

4. Thorough Practice

5. Encouraging self-study, and constructive criticism

VII. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	**Give Ss sentences and ask them to identify all the parts of speech discussed in the last four classes**	a2,a3, b1,b2, c1,c2, d1,d2	**6**	**5**
2	**Give Ss sentences and ask them to punctuate them. Give them sentences and ask them to edit punctuation in them.**	a1,a2,a3, b1,b2, c1,c2, d1,d2	**11**	**5**

VIII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Homework	6+11	10	10%	a1,a,2,a3, b1,b2, c1,c2, d1,d2
2	Quiz	4	5	5%	a1,a,2,a3, b1,b2, c1,c2, d1,d2
3	Mid-Term Exam	7	10	10%	a1,a,2,a3, b1,b2, c1,c2, d1,d2
4	Quiz	10	5	5%	A3, B3, C3

					D1, D2,D3,D4
5	final-Term Exam	13	70	70%	a1,a,2,a3, b1,b2, c1,c2, d1,d2

IX. Learning Resources:

1- Required Textbook(s) (maximum two).

Clarke, S.(2008), Macmillan English Grammar in Context (Essential with key), Macmillan Publishers Limited, Oxford.
Chakravarty, A., & Boehme, B.(eds), (2004), Gramar & Usage For Better Writing, Amsco School Publications, New York. -

2- Essential References.

1-
2-

3- Electronic Materials and Web Sites *etc*.

1-
2-
3-

X. Course Policies:

1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects**: - Assignments and projects will be assessed individually unless the teacher request for group work
5	**Cheating**:

	- Cheating by any means will cause the student failure and he/she must re-study the course
6	**Plagiarism:** Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:** -

Template for Course Plan (Syllabus) English Language (1)

I. Information about Faculty Member Responsible for the Course:

		Office Hours					
Name of Faculty Member							
Location& Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Identification and General Information:

1	Course Title:	English Language1				
2	Course Number & Code:	ENG101				
3	Credit hours:	C.H				Total
		Th.	Seminar	Pr.	F. Tr.	
		2				2
4	Study level/year at which this course is offered:	First Level, First Semester				
5	Pre –requisite (if any):	none				
6	Co –requisite (if any):					
7	Program (s) in which the course is offered	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	Language of teaching the course:	English Language				
9	System of Study:	Semester				
10	Mode of delivery:	Regular				
11	Location of teaching the course:	University				

III. Course Description:

It aims at familiarizing the students with the basic skills of the English language. It also provides the students with the help they need to start writing correct sentences and well-formed paragraphs.

IV. Course Objectives:

By the end of the course students would be able to:

1- Identify and use basic grammar elements like parts of speech, tenses, subject-verb agreement and punctuation to produce correct sentences.
2- Use their knowledge of language in language communication

V. Intended learning outcomes (ILOs) of the course:

- Brief summary of the knowledge or skill the course is intended to develop:
- Know the correct use and structure of different parts of speech (nouns, pronouns, verbs, adverbs, adjectives, and prepositions
- Understand the structure and use of the present simple tense, past simple tense, present continuous tense, and past continuous tense
- Identify subject-verb agreement, and punctuation and their use in context.
- Examine the correct use of parts of speech (nouns, pronouns, verbs, adverbs, adjectives, prepositions).
- -Explore the structure and use of the present simple tense, past simple tense, present continuous tense, and past continuous tense.
- Construct sentences with correct parts of speech, tense, subject-verb agreement and punctuation
- Edit sentences' subject-verb agreement and punctuation their applications in context
- Communicate effectively and accurately in English orally and in writing independently
- Assess the requirements of research and resources of Information related to drug discovery, development of pharmaceutical products and pharmaceutical-care practice.

VI. Course Content:

- Distribution of Semester Weekly Plan of Course Topics/Items and Activities.

A – Theoretical Aspect:

Order	Topics List	Week Due	Contact Hours
1	-Listing the topics they will be taught -Introduction to the nature of the course -Discussion of code of conduct, and course policy	1	2
2	Countable and uncountable nouns - 's or of - Compound nouns Subject pronouns, object pronouns, possessive pronouns, possessive adjective, reflexive pronouns	2+3	4
3	Adjective degrees - Making comparisons, - Superlative and - Comparative degrees - Adverb forms - Adverbs describing actions - Adverbs answering the questions: why, how, when, and where - Irregular adverbs	4+5	4

	Frequency adverbs		
4	Verb to be - Main verb -Helping verbs -Regular and irregular verbs	6	2
5	Mid-Term Exam	7	2
6	-structure -markers -agreement -uses	8	2
7	structure -markers -agreement -uses	9	2
	structure -markers -agreement -use -types of punctuation markers -importance of punctuation	10	2
	uses of comma and semicolon -Uses of capital letter and colon	11	2
	Write sentences in different tenses -Correct agreement and punctuation in given sentences and paragraphs	12	2
	Final Exam	13	2
Number of Weeks /and Units Per Semester		**13**	**26**

VII. Teaching strategies of the course:

1-Lectures
2-Class discussions and collaborative and individual practice as well as group work
3- Direct instruction on helpful cognitive strategies such as analyzing sentences, recognizing relationships and patterns, practicing, reasoning, summarizing, grouping, and associating
4. Thorough Practice
5. Encouraging self-study, and constructive criticism

VIII. Assignments:

No	Assignments	Week Due	Mark
1	Give Ss sentences and ask them to identify all the parts of speech discussed in the last four classes	6	5
2	Give Ss sentences and ask them to punctuate them. Give them sentences and ask them to edit punctuation in them	11	5

IX. Schedule of Assessment Tasks for Students During the Semester:

Assessment	Type of Assessment Tasks	Week Due	Mark	Proportion of Final Assessment
1	Homework	6+11	10	10%
2	**Quiz**	4	5	5%
3	Mid-Term Exam	7	10	10%
4	**Quiz**	10	5	5%
5	final-Term Exam	13	70	70%
6	Total		100	100%

X. Learning Resources:

- Written in the following order: (Author – Year of publication – Title – Edition – Place of publication – Publisher).

1- Required Textbook(s) (maximum two).

Clarke, S. (2008), Macmillan English Grammar in Context (Essential with key), Macmillan Publishers Limited, Oxford.
Chakravarty, A., & Boehme, B.(eds), (2004), Gramar & Usage For Better Writing, Amsco School Publications, New York

2- Essential References.

-1
-2
-3

3- Electronic Materials and Web Sites *etc*.

XI. Course Policies:

1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam.

2	**Tardy:** **-** any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** **-** any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** - Assignments and projects will be assessed individually unless the teacher request for group work.
5	**Cheating**: **-** Cheating by any means will cause the student failure and he/she must re-study the course.
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:**

Course Specification of Computer skills

I. Course Identification and General Information:

1	Course Title:	Computer skills				
2	Course Code & Number:	ITP101				
3	Credit hours:	C.H				TOTAL
		Th.	Seminar	practical	Training.	
		2		2		3
4	Study level/ semester at which this course is offered:	first Year- first Semester				
5	Pre –requisite (if any):	None				
6	Co –requisite (if any):					
7	Program (s) in which the course is offered:	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	Language of teaching the course:	English				
9	Study System	Semester				
10	Mode of delivery:	Regular				
11	Location of teaching the course:	Main Campus				
12	Prepared By:	Dr/Mohammed Alherwi				

II. Course Description:

This course is designed to provide student with basic terminology related to computer and to meet the needs of students in different areas of life .This course covers topics such as basic computer components, computer operating systems ,skills in folder and file management utilities, word processing, spreadsheets, and graphical presentations in the Windows environment, in addition to the learn how to use the internet, email, and social media, computer networks, their protection, and how to benefit from them, which enables the student to use the computer and the Internet efficiently to meet the needs of students in the his degree programs and career purposes.

III.	Course Intended learning outcomes (CILOs) of the course	WRITE Symbol and number of PILOs
a.1	Demonstrate good knowledge and understanding of Computer Basics, and its components.	A1
a.2	Explain Clearly concepts related to the current technology and its impact with the global development	A2
b1	Differentiate between different software and select the	B1

	appropriate software application to complete a desired task.	
c.1	Apply knowledge, understanding skills to use appropriate technological tools for personal, academic.	C1
c2	Automate routine tasks, analyze data more effectively in scientific research, learning and in his career.	C5
d1	Work effectively independently as well as in a team to deliver effective and well- documented software solutions to the problems.	D1
d2	Develops his career advancement, and personal growth abilities by using computing skills its applications	D2
d3	Commit the social and ethical responsibilities of a professional working in the discipline	D3

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	**Teaching strategies**	**Assessment Strategies**
a1. Demonstrate good knowledge and understanding of	- Lectures - Tutorials - Discussions - Cooperative learning	• Writing Exam • Quizzes • Assignments Assessment • Oral Exam
a2. Explain Clearly concepts related to the current technology and its impact with the global development		

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1. Differentiate between different software and select the appropriate software application to complete a desired task.	- Lectures - Brainstorming - Laboratory works - Discussions - Problem solving	• Writing Exam • Quizzes • Assignments Assessment

(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies

c1. Apply knowledge, understanding skills to use appropriate technological tools for personal, academic **c2**. Automate routine tasks, analyze data more effectively in scientific research, learning and in his career	- Lectures - Laboratory works - Self Learning - Presentation and simulation - Discussions - Problem solving - Cooperative learning	• Writing Exam • Quizzes • Assignments Assessment • Performance Observation

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1. Work effectively independently as well as in a team to deliver effective and well-documented software solutions to the problems. **d2**. Develops his career advancement, and personal growth abilities by using computing skills its applications **d3**.Commit the social and ethical responsibilities of a professional working in the discipline	- Lectures - Tutorials - Laboratory works - Discussions - Self-learning	**Quizzes &Exam** • Writing Exam • Quizzes • Assignments and project Assessment • Performance Observation

IV. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	contact hours
1	Computer fundamentals	a1, b1, d2	• Introduction • Main components of a computer • Characteristics of computer, • Storage Units • Role of Operating Systems, programs and apps • Data Representation	2	4
2	Operating system basics	a1, a2, b1, c1 c2,c3,d1,d2	• User Interface • Using Mouse, Use of Common Icons, Status Bar, • Using Menu	2	4

			• Managing Folders and Directories, • Managing Files • Common utilities.		
3	Word Processing	a1, a2,b1 c1, c2 d1,d2,d3	• Word Processing Basics • Text Creation and manipulation • Page Design and Layout • Formatting the Text • Headers & Footers: • Table Manipulation	3	6
4	Mid term exam			1	2
5	Spread Sheet	a1, a2, b1 c1, c2 d1,d2,d3	• Spreadsheet Functionality • Creating spreadsheets in Microsoft Excel • Typing text numbers and dates into a worksheet • Using functions • Formatting • Charts • Printing a worksheet	2	4
6	Making Presentations	a1, a2, b1 c1, c2 d1,d2,d3	• Using PowerPoint • Creation of Presentation • Preparation of Slides • Pictures & Graphics • SmartArt and shapes • Slide Show	2	4
7	Using Internet and Communication	a1, a2, b1 c1, c2 d1,d2,d3	• Basics of Computer Networks, • Internet • Using Web Browser • Search Engines, URLs • Emails • Joining a Zoom	2	4
8	Computer Security And Safety, Ethics, And Privacy	a1, a2, b1 c1, c2 d1,d2,d3	• Computer Security Risks • Internet and Network Attacks • Techniques to Prevent Unauthorized Computer Access and Use • Safeguards Against Hardware Theft and Vandalism • Safeguards Against Hardware Theft and Vandalism	1	2

9	Final term exam			1	2
Number of Weeks /and Units Per Semester				**16**	**32**

B - Practical Aspect:

Order	Tasks/ Experiments	Number of Weeks	contact hours	Learning Outcomes
1	• Knowledge of computer components	1	2	a1, b1, d2
2	• User Interface • Using Mouse, Use of Common Icons, Status Bar, • Using Menu • Managing Folders and Directories, • Managing Files • Common utilities.	2	4	a2, b1,c1 c2,c3,d1,d2
3	• Word Processing Basics • Text Creation and manipulation • Page Design and Layout • Formatting the Text • Headers & Footers: Table Manipulation	3	6	a2, b1 c1, c2 d1,d2,d3
4	• Creating spreadsheets in Microsoft Excel • Typing text numbers and dates into a worksheet • Using functions • Formatting Charts • Printing a worksheet	3	6	a1, a2,b1 c1, c2 d1,d2,d3
5	• PowerPoint Creation of Presentation • Preparation of Slides • Pictures & Graphics • SmartArt and shapes • Slide Show	2	4	a1, a2,b1 c1,c2 d1,d2,d3
	• Using Web Browser • Search Engines,	1	2	a1, a2,b1 c1, c2 d1,d2,d3

	URLs • Emails Joining a Zoom			
	Computer Security Safety, Backup and restore	1	2	a1, a2,b1 c1, c2 d1,d2,d3
	TOTAL	**13**	**26**	

V. Teaching strategies of the course:

- Lectures
- Tutorials
- Laboratory works
- Discussions
- Self-learning
- Laboratory works
- Presentation and simulation
- Cooperative learning

VI. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Creating Word document contains Heading, Footer, Text, tables, Header and footer using word	a1, a2, b1 c1, c2 d1,d2,d3	8th	5
2	Designing document using Excel with function	a1, a2, b1 c1, c2 d1,d2,d3	11th	3
3	Creating presentation with PowerPoint in specific subject and presenting it	a1, a2, b1 c1, c2 d1,d2,d3	13th	5
4	Searching about specific subject Using internet and search engine	a1, a2, b1 c1, c2 d1,d2,d3	14th	2

VII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Assignments	8th ,11th ,13th ,14th	15	10%	a1, a2, b1 c1, c2 d1,d2,d3

2	Quiz 1	4th	2	2%	a1, a2,
3	Midterm Exam	7th	10	10%	a1, a2, b1, b2
5	Quiz 2	12th	3	2%	a1, a2
7	Final Practical Exam	13	30	30%	a1, a2, b1 c1, c2 d1,d2,d3
8	Final theoretical Exam	16th	40	40%	a1, a2, b1 c1, c2 d1,d2,d3
	Total		100	100%	

VIII. Learning Resources:

1- Required Textbook(s) (maximum two).

1- Misty E. Vermaat, Susan L. Sebok, Steven M. Freund 2017 Discovering Computers 2017, Course Technology
2- Joe Habraken 2021 Microsoft Office Inside Out 2021, Microsoft Press 1st edition
3- Beginning Microsoft Office 2010 -Guy Hart-Davis

2- Essential References.

1- Joan Lambert 2022 Microsoft Office Step by Step (Office 2021 and Microsoft 365) Microsoft Pres edition

3- Electronic Materials and Web Sites *etc*.

1-www.office.com
2-www.microsoft.com/ar/-xm/windows.

X. Course Policies:

1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects**: - Assignments and projects will be assessed individually unless the teacher request for group

	work
5	**Cheating:** - Cheating by any means will cause the student failure and he/she must re-study the course
6	**Plagiarism:** Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:**

Template for Course Plan (Syllabus) Computer skills

I. Information about Faculty Member Responsible for the Course:

Name of Faculty Member		**Office Hours**						
Location& Telephone No.		**SAT**	**SUN**	**MON**	**TUE**	**WED**	**THU**	
E-mail								

II. Course Identification and General Information:

1	**Course Title:**	Computer skills				
2	**Course Code & Number:**	ITP101				
3	**Credit hours:**	C.H				Total
		Th.	Seminar	practical	Training.	
		2		1		3
4	**Study level/ semester at which this course is offered:**	first Year- first Semester				
5	**Pre –requisite (if any):**	None				
6	**Co –requisite (if any):**					
7	**Program (s) in which the course is offered:**	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	**Language of teaching the course:**	English				
9	**Study System**	Semester				
10	**Mode of delivery:**	Regular				
11	**Location of teaching the course:**	Main Campus				
12	**Prepared By:**	**Dr/Mohammed Alherwi**				

III. Course Description:

This course is designed to provide student with basic terminology related to computer and to meet the needs of students in different areas of life .This course covers topics such as basic computer components, computer operating systems ,skills in folder and file management utilities, word processing, spreadsheets, and graphical presentations in the Windows environment, in addition to the learn how to use the internet, email, and social media, computer networks, their protection, and how to benefit from them, which enables the student to use the computer and the Internet efficiently to meet the needs of students in the his degree programs and career purposes.

IV. Intended learning outcomes (ILOs) of the course:

- Brief summary of the knowledge or skill the course is intended to develop**:**

1- Demonstrate good knowledge and understanding of Computer Basics, and its components.

2- Explain Clearly concepts related to the current technology and its impact with the global development.
3- Differentiate between different software and select the appropriate software application to complete a desired task.
4- Apply knowledge, understanding skills to use appropriate technological tools for personal, academic.
5- Automate routine tasks, analyze data more effectively in scientific research, learning and in his career.
6- Work effectively independently as well as in a team to deliver effective and well- documented software solutions to the problems.
7- Develops his career advancement, and personal growth abilities by using computing skills its applications
8- Commit the social and ethical responsibilities of a professional working in the discipline.

V. Course Content:

- Distribution of Semester Weekly Plan of Course Topics/Items and Activities.

A – Theoretical Aspect:

Order	Topics List	Week Due	Contact Hours
1	**Computer fundamentals** • Introduction • Main components of a computer • Characteristics of computer, • Storage Units • Role of Operating Systems, programs and apps • Data Representation	1st & 2nd	4
2	**Operating system basics** • User Interface • Using Mouse, Use of Common Icons, Status Bar, • Using Menu • Managing Folders and Directories, • Managing Files • Common utilities.	3rd & 4th	4
3	**Word Processing** • Word Processing Basics	5th, 6th & 7th	6

	• Text Creation and manipulation • Page Design and Layout • Formatting the Text • Headers & Footers: • Table Manipulation		
4	**Mid term exam**	8th	2
5	**Spread Sheet** • Spreadsheet Functionality • Creating spreadsheets in Microsoft Excel • Typing text numbers and dates into a worksheet • Using functions • Formatting • Charts • Printing a worksheet	9th & 10th	4
6	**Making Presentations** • Using PowerPoint • Creation of Presentation • Preparation of Slides • Pictures & Graphics • SmartArt and shapes • Slide Show	11th & 12th	4
7	**Using Internet and Communication** • Basics of Computer Networks, • Internet • Using Web Browser • Search Engines, URLs • Emails • Joining a Zoom	13th & 14th	4
8	**Computer Security And Safety, Ethics, And Privacy** • Computer Security Risks • Internet and Network Attacks • Techniques to Prevent Unauthorized Computer Access and Use • Safeguards Against Hardware Theft and Vandalism • Safeguards Against Hardware Theft and Vandalism	15th	2
9	**Final term exam**	16th	2
Number of Weeks /and Units Per Semester		**16**	**32**

B – Practical Aspect: (if any)			
Order	**Topics List**	**Week Due**	**Contact Hours**

1	Knowledge of computer components	1st	2
2	• User Interface • Using Mouse, Use of Common Icons, Status Bar, • Using Menu • Managing Folders and Directories, • Managing Files • Common utilities.	2nd & 3rd	4
3	• Word Processing Basics • Text Creation and manipulation • Page Design and Layout • Formatting the Text • Headers & Footers: • Table Manipulation	4th, 5th & 6th	6
4	• Creating spreadsheets in Microsoft Excel • Typing text numbers and dates into a worksheet • Using functions • Formatting Charts • Printing a worksheet	7th, 8th & 9th	6
5	• PowerPoint Creation of Presentation • Preparation of Slides • Pictures & Graphics • SmartArt and shapes • Slide Show	10th & 11th	4
6	• Using Web Browser • Search Engines, URLs • Emails • Joining a Zoom	12th	2
7	Computer Security Safety, Backup and restore	13th	2
Number of Weeks /and Units Per Semester		**13**	**26**

VI. Teaching strategies of the course:

- Lectures
- Tutorials
- Laboratory works
- Discussions
- Self-learning
- Laboratory works
- Presentation and simulation
- Cooperative learning

VII. Assignments:

No	Assignments	Week Due	Mark
1	Creating Word document contains Heading, Footer, Text, tables, Header and footer using word	8th	5
2	Designing document using Excel with function	11th	3
3	Creating presentation with PowerPoint in specific subject and presenting it	13th	5
4	Searching about specific subject Using internet and search engine	14th	2

VIII. Schedule of Assessment Tasks for Students During the Semester:

Assessment	Type of Assessment Tasks	Week Due	Mark	Proportion of Final Assessment
1	Assignments	8th ,11th ,13th ,14th	15	10%
2	Quiz 1	4th	2	2%
3	Midterm Exam	7th	10	10%
4	Quiz 2	12th	3	2%
5	Final Practical Exam	13	30	30%
6	Final theoretical Exam	16th	40	40%
7	Total		100	100%

IX. Learning Resources:

1- Required Textbook(s) (maximum two).

1- Misty E. Vermaat, Susan L. Sebok, Steven M. Freund 2017 Discovering Computers 2017, Course Technology
2- Joe Habraken 2021 Microsoft Office Inside Out 2021, Microsoft Press 1st edition
3- Beginning Microsoft Office 2010 -Guy Hart-Davis

2- Essential References.

1- Joan Lambert 2022 Microsoft Office Step by Step (Office 2021 and Microsoft 365) Microsoft Press, 1st edition

3- Electronic Materials and Web Sites *etc*.

1-www.office.com
2-www.microsoft.com/ar/-xm/windows

x.	Course Policies:
1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
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3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** Assignments and projects will be assessed individually unless the teacher request for - group work
5	**Cheating**: Cheating by any means will cause the student failure and he/she must re-study the course -
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:** -

Course Specification of Communication skills

I.المعلومات العامة عن المقرر:						
1	اسم المقرر:	Communication skills				
2	رمز المقرر ورقمه:	COM 101				
3	الساعات المعتمدة:	محاضرة	سمنار	عملي	تدريب	الإجمالي
		2				2
	المستوى والفصل الدراسي:	المستوى الاول، الفصل الدراسي الأول				
4	المتطلبات السابقة لدراسة المقرر(إن وجدت):	لا يوجد				
5	المتطلبات المصاحبة لدراسة المقرر(إن وجدت):	لا يوجد				
6	البرنامج/التي يتم فيها تدريس المقرر:	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
7	لغة تدريس المقرر:	العربية				
8	نظام الدراسة:	فصلي				
9	أسلوب الدراسة في البرنامج:	انتظام				
10	مكان تدريس المقرر:	كلية العلوم الطبية والصحية				
11	اسم معد مواصفات المقرر:	د.عبدالغني علي المسلمي				

II. وصف المقرر الدراسي:

يتناول المقرر عدداً من الموضوعات والمفاهيم والمهارات الإدارية المهمة التي يحتاجها الطلبة ، حيث يركز المقرر على موضوعات مثل: مهارات الاتصال الذاتي والشخصي وفي المجموعات الصغيرة، والاتصال الشفوي والكتابي وغير الشفوي (لغة الجسد)، كما يركز على مهارات إدارة الاجتماعات، مهارات إدارة الوقت، مهارات كتابة التقارير، ومهارات العرض، ومهارات التفاوض، ومهارات الحوار والتعامل مع الآخرين.

III. مخرجات التعلم المقصودة للمقرر:	
عندالانتهاء من دراسة هذا المقرر، سوف يكون الطالب قادراعلى أن:	
a1- يظهر معرفة واسعة بمبادئ وسبل التواصل والعلاقات العامة.	A
c1 - يجيد التواصل مع المرضى وادارة النقاشات مع الزملاء والعاملين في المجال، والمشاركة الفاعلة فيها.	C1
c2 - يقدم المشورة والنصح للمرضى وأسرهم وللمجتمع وغيرهم من المتخصصين في الرعاية الصحية حول الاستخدام الآمن والعقلاني للأدوية والأجهزة الطبية والرعاية الذاتية وتعزيز الصحة والوقاية من الأمراض.يطبق المهارات الحياتية في المواقف والظروف المختلفة	**C4**

d1- يظهر مقدرة جيدة في الإدارة والقيادة الفعالة، والتفكير الناقد، وحل المشكلات، ومهارات الاتصال.	**D1**

IV. تحديد وكتابة مواضيع المقرر الرئيسة والفرعية (النظرية والعملية) وربطها بمخرجات التعلم المقصودة للمقرر مع تحديد الساعات المعتمدة لها.

الرقم	وحدات/ موضوعات المقرر	المواضيع التفصيلية	عدد الأسابيع	الساعات الفعلية
1	**مدخل الى المهارات الحياتية**	مفهوم المهارات الحياتية انواع المهارات الحياتية وتصنيف المنظمات العالمية لها اهمية المهارات الحياتية مراحل تعلم المهارات الحياتية	2	4
2	**المهارات الادراكية والذهنية**	مفهوم التفكير وانواعه مهارات التفكير المعرفي مهارات التفكير فوق المعرفي مهارات التفكير الناقد مهارات التفكير الابداعي والابتكاري مهارات حل المشكلات واتخاذ	3	6
3	مهارات ادارة الذات وتنميتها	مهارات الادراك الذهني مفهوم الذات وتقدير الذات والثقة بالنفس مهارات الوعي الذاتي مهارات ادارة الوقت وتحقيق الأهداف الشخصية مهارات إدارة التوتر والضغوط النفسية مهارات إدارة الغضب والتكيف ومواجهة الظروف الصعبة مهارات تقييم الذات وتنميتها	3	6
4	**المهارات الاجتماعية**	مهارات الذكاء العاطفي مهارات الاتصال مهارات ادارة الخلافات والنزاعات	3	6
5	**مهارات العمل المشترك**	مهارات العمل ضمن فريق مهارات ريادة الأعمال المواطنة الرقمية	3	6

إجمالي الأسابيع والساعات	82

V. استراتيجية التدريس

1. طريقة المحاضرات النظرية.
2. سلوب المناقشة ودراسة الحالات (جزء من وقت المحاضرة).
3. السبورة، الكتاب المقرر، الزيارات الميدانية، الإنترنت، المكتبة.
4. الأسئلة، العروض المقدمة،

VI. التعيينات:

الرقم	التكليف/النشاط	الأسبوع	الدرجة
1	كتابة تقرير عن الامثال الشعبية المستخدمة كمهارات حياتية	1-12	15
2	اعداد خطة مشروع ريادي	11	15

الرقم	أنشطة التقويم	الأسبوع	الدرجة	نسبة الدرجة إلى درجة التقويم النهائي
1	كتابة تقرير عن الامثال الشعبية المستخدمة في المهارات حياتية	12-1	15	%15
2	اعداد خطة مشروع ريادي	11	15	%15
3	الاختبار النهائي	نهاية الفصل الدراسي	70	70%

VII. مصادر التعلم:

(اسم المؤلف، سنة النشر، اسم الكتاب، دار النشر، بلد النشر).

المراجع الرئيسة: (لا تزيد عن مرجعين)

1. محمد بالراشد، فوزي الطواهري، سهيل كمون (2019) التربية على المهارات الحياتية أسس مرجعية ونماذج تطبيقية، المشروع المشترك بين وزارة الصحة ووزارة التربية ووزارة الشئون الاجتماعية، ومكتب اليونسيف بتونس.
2. منظمة اليونسييف (2021)، تعليم المهارات الحياتية، نحو رؤية جديدة للتعليم.
3. منظمة اليونسييف (2021)، المهارات الحياتية في منطقة الشرق الاوسط وشمال افريقيا.
4. جامعة شقراء (2019)، مهارات اكاديمية وحياتية، السعودية.

المراجع المساعدة

سامي محمد هشام (2017) مهارات حياتية، دار وائل للطباعة والنشر، الاردن

مواد إلكترونية وإنترنت: (إن وجدت)

موقع منظمة اليونسييف www.unicef.org/ar/mena/

XI. Course Policies:

1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam.
2	**Tardy:**

	- any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
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6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:**

Template for Course Plan (Syllabus) of Communication skills

VIII. معلومات عن مدرس المقرر:							
الاسم		الساعات المكتبية (2/ أسبوعيا)					
المكان ورقم الهاتف		السبت	الأحد	الاثنين	الثلاثاء	الأربعاء	الخميس
البريد الإلكتروني							

IX. المعلومات العامة عن المقرر:						
1	اسم المقرر:	Communication skills				
2	رمز المقرر ورقمه:	COM 101				
3	الساعات المعتمدة:	محاضرة	سمنار	عملي	تدريب	الإجمالي
		2				2
	المستوى والفصل الدراسي:	المستوى الاول، الفصل الدراسي الأول				
4	المتطلبات السابقة لدراسة المقرر(إن وجدت):	لا يوجد				
5	المتطلبات المصاحبة لدراسة المقرر(إن وجدت):	لا يوجد				
6	البرنامج/التي يتم فيها تدريس المقرر:	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
7	لغة تدريس المقرر:	العربية				
8	نظام الدراسة:	فصلي				
9	أسلوب الدراسة في البرنامج:	انتظام				
10	مكان تدريس المقرر:	كلية العلوم الطبية والصحية				
11	اسم معد مواصفات المقرر:	د.عبدالغني علي المسلمي				

X. وصف المقرر الدراسي:

يتناول المقرر عدداً من الموضوعات والمفاهيم والمهارات الإدارية المهمة التي يحتاجها الطلبة ، حيث يركز المقرر على موضوعات مثل: مهارات الاتصال الذاتي والشخصي وفي المجموعات الصغيرة، والاتصال الشفوي والكتابي وغير الشفوي (لغة الجسد)، كما يركز على مهارات إدارة الاجتماعات، مهارات إدارة الوقت، مهارات كتابة التقارير، ومهارات العرض، ومهارات التفاوض، ومهارات الحوار والتعامل مع الآخرين.

XI. مخرجات التعلم المقصودة للمقرر:
عندالانتهاء من دراسة هذا المقرر، سوف يكون الطالب قادراعلى: 1. يناقش مفهوم المهارات الحياتية 2. يقارن بين المواقف الحياتية ويصنفها ويرتبها حسب اولويتها 3. يفكر بشكل ابداعي وابتكاري لمواجهة المشكلات والظروف الصعبة 4. يطبق المهارات الحياتية في المواقف والظروف المختلفة 5. يجيد إدارة وقته بكفاءة 6. يستخدم مهارات الاتصال بفاعلية في مختلف المواقف الحياتية

XII. تحديد وكتابة مواضيع المقرر الرئيسة والفرعية (النظرية والعملية) وربطها بمخرجات التعلم المقصودة للمقرر مع تحديد الساعات المعتمدة لها.

الرقم	وحدات/ موضوعات المقرر	المواضيع التفصيلية	عدد الأسابيع	الساعات الفعلية
1	**مدخل الى المهارات الحياتية**	مفهوم المهارات الحياتية انواع المهارات الحياتية وتصنيف المنظمات العالمية لها اهمية المهارات الحياتية مراحل تعلم المهارات الحياتية	2	4
2	المهارات الادراكية والذهنية	مفهوم التفكير وانواعه مهارات التفكير المعرفي مهارات التفكير فوق المعرفي مهارات التفكير الناقد مهارات التفكير الابداعي والابتكاري مهارات حل المشكلات واتخاذ	3	6
3	مهارات ادارة الذات وتنميتها	مهارات الادراك الذهني مفهوم الذات وتقدير الذات والثقة بالنفس مهارات الوعي الذاتي مهارات ادارة الوقت وتحقيق الأهداف الشخصية مهارات إدارة التوتر والضغوط النفسية مهارات إدارة الغضب والتكيف ومواجهة الظروف الصعبة	3	6

		مهارات تقييم الذات وتنميتها		
4	المهارات الاجتماعية	مهارات الذكاء العاطفي مهارات الاتصال مهارات ادارة الخلافات والنزاعات	3	6
5	مهارات العمل المشترك	مهارات العمل ضمن فريق مهارات ريادة الأعمال المواطنة الرقمية	3	6
إجمالي الأسابيع والساعات				**28**

XIII. استراتيجية التدريس

5. **طريقة المحاضرات النظرية .**
6. **سلوب المناقشة ودراسة الحالات (جزء من وقت المحاضرة).**
7. **السبورة , الكتاب المقرر, الزيارات الميدانية, الإنترنت, المكتبة.**
8. **الأسئلة, العروض المقدمة,**

I. التعيينات:

الرقم	التكليف/النشاط	الأسبوع	الدرجة
1	كتابة تقرير عن الامثال الشعبية المستخدمة كمهارات حياتية	1-12	15
2	اعداد خطة مشروع ريادي	11	15

الرقم	أنشطة التقويم	الأسبوع	الدرجة	نسبة الدرجة إلى درجة التقويم النهائي
1	كتابة تقرير عن الامثال الشعبية المستخدمة في المهارات حياتية	12-1	15	%15
2	اعداد خطة مشروع ريادي	11	15	%15
3	الاختبار النهائي	نهاية الفصل الدراسي	70	70%

I. مصادر التعلم:

(اسم المؤلف، سنة النشر، اسم الكتاب، دار النشر، بلد النشر).

المراجع الرئيسة: (لا تزيد عن مرجعين)

1 – محمد بالراشد، فوزي الطواهري، سهيل كمون (2019) التربية على المهارات الحياتية أسس مرجعية ونماذج تطبيقية، المشروع المشترك بين وزارة الصحة ووزارة التربية ووزارة الشئون الاجتماعية، ومكتب اليونسيف بتونس.
2-منظمة اليونسييف (2021)، تعليم المهارات الحياتية، نحو رؤية جديدة للتعليم.

3- منظمة اليونسييف (2021)، المهارات الحياتية في منطقة الشرق الاوسط وشمال افريقيا. **4- جامعة شقراء (2019)، مهارات اكاديمية وحياتية، السعودية.**
المراجع المساعدة
سامي محمد هشام (2017) مهارات حياتية، دار وائل للطباعة والنشر، الاردن
مواد إلكترونية وإنترنت: (إن وجدت)
1- موقع منظمة اليونسييف www.unicef.org/mena/ar/

XII. Course Policies:	
1	Class Attendance: - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam.
2	Tardy: - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	Exam Attendance/Punctuality: - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	Assignments & Projects: Assignments and projects will be assessed individually unless the teacher request for group work. -
5	Cheating: - Cheating by any means will cause the student failure and he/she must re-study the course.
6	Plagiarism: Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the faculty rules.

Course Specification of General Biology

I. Course Identification and General Information:

1	Course Title:	General Biology				
2	Course Code & Number:	MED111				
3	Credit hours:	C.H				TOTAL
		Th.	Seminar	practical	Training.	
		2		1		3
4	Study level/ semester at which this course is offered:	First level / First semester				
5	Pre –requisite (if any):	None				
6	Co –requisite (if any):	None				
7	Program (s) in which the course is offered:	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	Language of teaching the course:	English Language				
9	Study System	Semester				
10	Mode of delivery:	Regular				
11	Location of teaching the course:	University				
12	Prepared By:	Dr. Moufeed Al-Athwary				

II. Course Description:

The course provides students with basic principles of biology. The course covers the following topics: introduction to biology, classification of eukaryotic and prokaryotic organisms, Animal cell structure and organelles functions, biological membrane structure and transport across membranes, Cellular communication, cell division, DNA and RNA structure & function, DNA Replication, Gene expression and DNA recombination. The students will also apply knowledge in performing some basic laboratory experiments.

III. Course Objectives:

Upon successful completion of the course, the students should be able to:

- Identify the different classes of organisms and differentiate between prokaryotic and eukaryotic cells.
- Recognize the structure of the plasma membrane and cellular organelles and their functions.
- Explain the cell cycle, the transport of substances across membranes and communication between cells.
- Outline the principles of molecular genetics.
- Correlates biological cell structure with its function in human body.
- Perform various biology experiments.

IV.	Course Intended learning outcomes (CILOs) of the course	WRITE Symbol and number of PILOs
a.1	Identify the principles of basic science related to organisms' classification and differentiate prokaryotic cells from eukaryotic cells.	**A1**
a.2	Demonstrate an understanding of knowledge of the cell structure and its various organelles and their functions.	**A1,A3**
a.3	Understand the DNA and RNA structure & function and explain the steps of DNA replication, transcription and translation.	**A1,A3**
b.1	Apply the basic concept of the receptor and signal transduction mechanisms to understand the potential mechanism of action of the drugs.	**B1**
c.1	Handle and dispose the chemical and biological materials safely and implement different laboratory procedures for preparation of biological samples.	**C1**
c.2	Use effectively lab instruments and glass-wares used for identification of the different biomolecules.	**C1**
d.1	Demonstrate effective verbal and non-verbal communication skills.	**D1**
d.2	Retrieve information about biology and work autonomously and effectively as a team member.	**D1, D3**

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1- Identify the principles of basic science related to organisms' classification and differentiate prokaryotic cells from eukaryotic cells.	- Lectures and Groups discussion. - Self – learning.	- In-class participation - Quizzes - Homework Evaluation. - Written exam.
a2- Demonstrate an understanding of knowledge of the cell structure and its various organelles and their functions.		
a3- Understand the DNA and RNA structure & function and explain the steps of DNA replication, transcription and translation.		

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1- Apply the principles of cell structure and function and molecular genetics in health and disease states to manage	- Groups discussion. - Brainstorming.	- In-class participation - Quizzes - Written exam.

different diseases.		

(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	**Teaching strategies**	**Assessment Strategies**
c1- Handle and dispose the chemical and biological materials safely and implement different laboratory procedures for preparation of biological samples.	- Practical classes - Brainstorming.	- Observation - Task's Evaluation.
c2- Use effectively lab instruments and glass-wares used for identification of the different biomolecules.		

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	**Teaching strategies**	**Assessment Strategies**
d1- Demonstrate effective verbal and non-verbal communication skills.	- Group discussions. - Cooperative & Self – learning. - Practical classes.	- Oral Presentation & discussion - Homework Evaluation. - Reports
d2- Retrieve information about biology and work autonomously and effectively as a team member.		

V. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	contact hours
1	**Introduction to Biology**	**a1, d1,**	* Distribution of course syllabus on study weeks * Definitions * Important of studying biology * Characteristics of life	**1**	**2**
2	**Classification of prokaryotic organisms**	**a1, a2, d1, d2**	*** Viruses:** - Definition - Properties. - Shapes - Life cycle. *** Archae:** - Definition - Properties.	**2**	**4**

			*** Bacteria:** - Shapes - Structure - Types - Methods of genetic material transfer.		
3	**Classification of Eukaryotic organisms**	**a1, b1, d1, d2**	Protista Fungi Plantae Animalia Different between pro-and eukaryotic cells	**1**	**2**
4	**Animal cell structure and organelles functions**	**a2, b1, d1, d2**	* Human cell structure. * Membranous cell organelles and their functions. * Non-membranous cell organelles and their functions.	**2**	**4**
5		**a1, a2, b1, d1, d2**	**Mid-Term Exam**	**1**	**2**
6	**Biological cell membrane**	**a2,b1, d1, d2**	- Definition -Molecular structure of cell membrane - Models of membrane structure (Fluid mosaic model) - Functions - Transport across membranes (passive and active transports…etc).	**2**	**4**
7	**Cellular communication and signaling transduction**	**a2, b1, d1, d2**	- Direct communication through gap junctions. - Indirect communication through chemical messengers: functional classification of chemical messengers (paracrines, neurotransmitters, and hormones), functional classes of receptors, signal transduction mechanisms.	**2**	**4**

8	**Cell Division**	**a3, b1, d1, d2**	- Stages, events, and significance of somatic (mitosis) and reproductive cell division (meiosis). - Regulation of the cell cycle.	**1**	**2**
9	**Molecular biology and genetics**	**a3, b1, d1, d2**	- DNA and RNA structure & function. - DNA Replication - Gene expression (Transcription and translation). - Recombinant DNA – Genetic engineering	**3**	**6**
10		**a1-3, b1, d1, d2**	**Final Term exam**	**1**	**2**
Number of Weeks /and Units Per Semester				**16**	**32**

B - Practical Aspect:

Order	Tasks/ Experiments	Number of Weeks	Contact hours	Learning Outcomes
1	Introduction to experiments in biology and Scientific method steps.	**1**	**2**	**c1-c2, d1, d2**
2	Study of Microscope: Types, Properties and components, how to use it and scientific drawing.	**1**	**2**	**c1-c2, d1, d2**
3	- The cell: Types and shape. - Nucleus: Shapes and number - Preparation of some cells from animal and examine them by the use of microscope.	**2**	**4**	**c1-c2, d1, d2**
4	- Cell division - Calculate the mitotic index	**1**	**2**	**c1-c2, d1, d2**
5	Cell chemistry: Organic components, Detection of proteins, carbohydrates, fats and enzymes.	**2**	**4**	**c1-c2, d1, d2**
6	The Cell Physical properties.	**1**	**2**	**c1-c2, d1, d2**
7	Animal tissues: Types and origin.	**2**	**4**	**c1-c2, d1, d2**
8	General revision	**1**	**2**	**c1-c2, d1, d2**
9	**Final Practical Exam**	**1**	**2**	**c1-c2, d1, d2**
Number of Weeks /and Units Per Semester		**12**	**24**	

VI. Teaching strategies of the course:

- Lectures and Groups discussion.
- Brainstorming.
- Practical classes
- Cooperative & Self – learning.

VII. Assignments:

No	Assignments	Aligned CILOs (symbols)	Week Due	Mark
1	Participation, Homework	**a1-3, b1,c1, d1, d2**	weekly	**5**
2	**Total Score**			**5**

VIII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Tasks and Assignments	**1-14**	**5**	5%	**a1-a3, b1, c1-c2, d1-d2**
2	Quizzes 1	**W6**	2.5	2.5%	**a1, a2, b1**
3	Mid-term exam	**W7**	10	10%	**a1, a2, b1, d1, d2**
4	Quizzes 2	**W12**	2.5	2.5%	**a1, a2, a3, b1, d1-d2**
5	Practical lab work and Reports	**W1-11**	10	10%	**c1-c2, d1-d2**
6	Final exam (practical)	**W12**	30	30%	**c1-c2, d1-d2**
7	Final exam (Theoretical part)	**W16**	40	40%	**a1-a3, b1, d1, d2**
	Total		100	100%	

IX. Learning Resources:

1- Required Textbook(s) (maximum two).

1- Nalini Chandar. 2019, Lippincott Illustrated Reviews: cell and molecular biology (Lippincott Illustrated Reviews Series) Second edition, Philadelphia: Wolters Kluwer, ISBN978146348500.
2- Gerald Carp. 2010. Cell and Molecular Biology Concepts and Experiments, sixth edition, John Wiley and sons Inc.

2- Essential References.

1- O'Connor, C. M. & Adams, J. U. 2010. Essentials of Cell Biology. Cambridge, MA: NPG Education.

3- Electronic Materials and Web Sites *etc.*

X.Course Policies:	
1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects**: - Assignments and projects will be assessed individually unless the teacher request for group work
5	**Cheating**: Cheating by any means will cause the student failure and he/she must re-study the course
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the faculty rules.
7	**Other policies**: -

Template for Course Plan (Syllabus) of General Biology

I. Information about Faculty Member Responsible for the Course:

		Office Hours					
Name of Faculty Member							
Location& Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Identification and General Information:

1	Course Title:	General Biology				
2	Course Code & Number:	**MED111**				
3	Credit hours:	C.H				TOTAL
		Th.	Seminar	practical	Training.	
		2		1		3
4	Study level/ semester at which this course is offered:	first level, first semester				
5	Pre –requisite (if any):	None				
6	Co –requisite (if any):	None				
7	Program (s) in which the course is offered:	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	Language of teaching the course:	English Language				
9	Study System	Semester				
10	Mode of delivery:	Regular				
11	Location of teaching the course:	University				

III. Course Description:

The course provides students with basic principles of biology. The course covers the following topics: introduction to biology, classification of eukaryotic and prokaryotic organisms, Animal cell structure and organelles functions, biological membrane structure and transport across membranes, Cellular communication, cell division, DNA and RNA structure & function, DNA Replication, Gene expression and DNA recombination. The students will also apply knowledge in performing some basic laboratory experiments.

IV. Course Objectives:

Upon successful completion of the course, the students should be able to:

- Identify the different classes of organisms and differentiate between prokaryotic and eukaryotic cells.
- Recognize the structure of the plasma membrane and cellular organelles and their functions.
- Explain the cell cycle, the transport of substances across membranes and communication between cells.
- Outline the principles of molecular genetics.
- Correlates biological cell structure with its function in human body.
- Perform various biology experiments.

V. Intended learning outcomes (ILOs) of the course:

Upon successful completion of this course, the student should be able to:

1- Identify the principles of basic science related to organisms' classification and differentiate prokaryotic cells from eukaryotic cells.
2- Demonstrate an understanding of knowledge of the cell structure and its various organelles and their functions.
3- Understand the DNA and RNA structure & function and explain the steps of DNA replication, transcription and translation.
4- Apply the principles of cell structure and function and molecular genetics in health and disease states to manage different diseases.
5- Handle and dispose the chemical and biological materials safely and implement different laboratory procedures for preparation of biological samples.
6- Use effectively lab instruments and glass-wares used for identification of the different biomolecules.
7- Demonstrate effective verbal and non-verbal communication skills.
8- Retrieve information about biology and work autonomously and effectively as a team member.

VI. Course Content:

A – Theoretical Aspect:

Order	Topics List	Week Due	Contact Hours
1	**Introduction to Biology:** * Distribution of course syllabus on study weeks * Definitions * Important of studying biology * Characteristics of life	1	2

2	**Classification of prokaryotic organisms** *** Viruses:** Definition, Properties, Shapes, Life cycle. *** Archae:** Definition, Properties. *** Bacteria:** Shapes, Structure**,** Types, Methods of genetic material transfer.	2, 3	4
3	**Classification of Eukaryotic organisms:** Protista, Fungi, Plantae, Animalia Different between pro-and eukaryotic cells.	4	2
4	**Animal cell structure and organelles functions:** * Human cell structure. * Membranous cell organelles and their functions. * Non-membranous cell organelles and their functions.	5, 6	4
5	**Mid-Term Exam**	7	2
6	**Biological cell membrane:** - Definition -Molecular structure of cell membrane - Models of membrane structure (Fluid mosaic model) - Functions - Transport across membranes (passive and active transports…etc).	8, 9	4
7	**Cellular communication and signaling transduction:** - Direct communication through gap junctions. - Indirect communication through chemical messengers: functional classification of chemical messengers (paracrines, neurotransmitters, and hormones), functional classes of receptors, signal transduction mechanisms.	10, 11	4
8	**Cell Division:** - Stages, events, and significance of somatic (mitosis) and reproductive cell division (meiosis). - Regulation of the cell cycle.	12	2
9	**Molecular biology and genetics:** - DNA and RNA structure & function. - DNA Replication - Gene expression (Transcription and translation). - Recombinant DNA – Genetic engineering	13, 14, 15	6
10	**Final Term exam**	16	2
Number of Weeks /and Units Per Semester		**16**	**32**

B – Practical Aspect:

Order	Topics List	Week Due	Contact Hours
1	Introduction to experiments in biology and Scientific method steps.	1	2
2	Study of Microscope: Types, Properties and components, how to use it and scientific drawing.	2	2
3	- The cell: Types and shape. - Nucleus: Shapes and number - Preparation of some cells from animal and examine them by the use of microscope.	3, 4	4
4	- Cell division - Calculate the mitotic index	5	2
5	Cell chemistry: Organic components, Detection of proteins, carbohydrates, fats and enzymes.	6, 7	4
6	The Cell Physical properties.	8	2
7	Animal tissues: Types and origin.	9, 10	4
8	General revision	11	2
9	Final Practical Exam	12	2

Number of Weeks /and Units Per Semester	12	24

VII. Teaching strategies of the course:

- Lectures and Groups discussion.
- Brainstorming.
- Practical classes
- Cooperative & Self – learning.

VIII. Assignments:

No	Assignments	Week Due	Mark
1	Participation, Homework	weekly	2.5
2	**Total Score**		5

IX. Schedule of Assessment Tasks for Students During the Semester:

Assessment	Type of Assessment Tasks	Week Due	Mark	Proportion of Final Assessment
1	Tasks and Assignments	**1-14**	**5**	**5%**
2	Quizzes 1	**W6**	2.5	2.5%
3	Mid-term exam	**W7**	10	10%
4	Quizzes 2	**W12**	2.5	2.5%
5	Practical lab work and Reports	**W1-11**	10	10%
6	Final exam (practical)	**W13, 14**	30	30%
7	Final exam (Theoretical part)	**W16**	40	40%
8	**Total**		100	100%

X. Learning Resources:

1- Required Textbook(s).

1- Nalini Chandar. 2019, Lippincott Illustrated Reviews: cell and molecular biology (Lippincott Illustrated Reviews Series) Second edition, Philadelphia: Wolters Kluwer, ISBN978146348500.

2- Gerald Carp. 2010. Cell and Molecular Biology Concepts and Experiments, sixth edition, John Wiley and sons Inc.

2- Essential References.

1- O'Connor, C. M. & Adams, J. U. 2010. Essentials of Cell Biology.. Cambridge, MA: NPG Education.

3- Electronic Materials and Web Sites *etc*.

XI.Course Policies:

1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam.
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:**

	- any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** - Assignments and projects will be assessed individually unless the teacher request for group work.
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course.
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:**

Course Specification of General Chemistry

I. Course Identification and General Information:

1	Course Title:	General Chemistry				
2	Course Code & Number:	MED112				
3	Credit hours:	C.H				TOTAL
		Th.	Seminar	practical	Training.	
		2	-	1	-	3
4	Study level/ semester at which this course is offered:	First year- 1st semester				
5	Pre –requisite (if any):	None				
6	Co –requisite (if any):	None				
7	Program (s) in which the course is offered:	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	Language of teaching the course:	English				
9	Study System	Semester				
10	Mode of delivery:	Regular				
11	Location of teaching the course:	Al-Saeed University Campus				
12	Prepared By:	Dr. Niyazi A. S. Al-Areqi				

II. Course Description:

This course covers fundamentals of chemistry. It includes Introduction, Matter and Measurement, Atoms, Molecules, and Ions, Stoichiometry: Calculations with Chemical Formulas and Equations, Aqueous Reactions & Solution Stoichiometry, Thermochemistry, Electronic Structure of Atoms, Periodic Properties of the Elements, Basic Concepts of Chemical Bonding, Molecular Geometry and Bonding Theories. Students will be able to have knowledge and understanding of essential facts, concepts, theories and foundations of chemistry. They are also able to apply knowledge in performing some basic laboratory experiments.

III. Course Objectives:

1- This introductory course is aimed to satisfy specifically the needs of pharmacy students.
2- Students will have the fundamentals of the main fields of chemistry and will be able to go through other courses like Organic, Analytical, Physical and Medicinal Chemistry.
3- Students will get the skills of scientific thinking and solving of problems.

IV. Course Intended learning outcomes (CILOs) of the course		WRITE Symbol and number of PILOs
a.1	Classify elements according to their electronic structure and	A1

	understand how that affects periodic properties.	
a.2	Understand the concepts of stoichiometry and line spectra their importance.	A1
a.3	Comprehend the nature of aqueous chemical reactions and their properties.	A1, A2
b.1	Master unit conversion & basic chemical calculation.	B1, B2
b.2	Balance chemical equation and relate the reactants and product using stoichiomtery concept.	B1, B2
c.1	Handle chemicals in their various forms in a safe manner and use glassware and equipment appropriately.	C1
d.1	Demonstrate critical thinking, problem-solving, decision making teem working and communication with others.	D1
d.2	Perform online computer search to retrieve chemical information from a variety of sources.	D3

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a.1 Classify elements according to their electronic structure and understand how that affects periodic properties.	- Lectures - Assignments	- Written Examinations - Assignments
a.2 Understand the concepts of stoichiometry and line spectra their importance.	- Lectures	- Written Examinations
a.3 Comprehend the nature of aqueous chemical reactions and their properties.	- Lectures	- Written Examinations - Oral Examinations - Quizzes

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b.1 Master unit conversion & basic chemical calculation.	- Lectures	- Written Examinations - Quizzes
b.2 Balance chemical equation and relate the reactants and product using	- Lectures - Assignments	- Written Examinations - Assignments - Oral Examinations

stoichiomtery concept.		

(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1- Handle chemicals in their various forms in a safe manner and use glassware and equipment appropriately.	- Practical classes	- Practical reports - Practical Examinations

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d.1 Demonstrate critical thinking, problem-solving, decision making teem working and communication with others.	- Lectures - Practical classes - Interactive class discussions	- Written Examinations - Practical Examinations - Oral Examinations Practical reports
d.2 Perform online computer search to retrieve chemical information from a variety of sources.	- Lectures - Practical classes	- Assignments - Practical Examinations - Oral Examinations

V. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	contact hours
1	Introduction	a1, a2, b1,d1,d2	- The study of chemistry. - Properties of Matter. - Units of measurement. - Uncertainty in measurement. - Dimensional analysis.	2	4
2	Atomic structure	a1,a2, b1,d1,d4	-The atomic theory of matter. -The discovery of atomic structure. -The modern view of atomic structure.	1	2
3	Periodic table	a1,a2, d1,d2	-The Periodic table and properties. -Molecules and molecular compounds. -Io2s & Ionic compounds.	1	2

4	Chemical Calculation (1)	a2. a3,b1,b2, d1,d2	-Chemical equations and patterns of chemical reactivity. -Atomic and molecular weights and the mole. -Empirical formulas from analyses.	1	2
5		a2. a3,b1,b2, d1,d2	-Quantitative information from balanced equations. -Limiting reactants. - Solution composition and Properties of solutes in aqueous solution.	1	2
6		a1,a2,a3, b1, b2, d1,d2	**Mid-Term exam**	1	2
7	Chemical Calculation (2)	a.2, a3, b1,b2,d1	-Acids, bases, salts and ionic equations. -Acids, bases and neutralization reaction. -Oxidation reduction reactions - Concentration of solutions - Solution Stoichiometry and Chemical analysis.	1	2
8	Thermodynamics & Thermochemistry	a2, a3, b1, b2, d1, d2	- Kinetic energy and potential energy and units of energy - Transferring of energy between system and surrounding -The first law of thermodynamics and Enthalpy. - Enthalpies of reaction - Calorimetry - Hess's law and Enthalpies of formation.	1	2
9	Atomic models of atom	a1,a2, b1, d1,d2	-The wave nature of light, quantified energy and photons.-Bohr's model of hydrogen atom and the wave behavior of matter. -Quantum mechanics and atomic orbitals. -Representation of atomic	1	2

			orbitals and molecular orbitals.		
10	Electron configuration and periodic properties	a1,a3, b1, d1,d2	- Electron configuration. - Electron configuration and the periodic table. -Development of the periodic table and electron shells and the size of atoms.	1	2
11	Electron configuration and periodic properties	a1,a3, b1, d1,d2	-Ionization energy. - Electron affinity. -Lewis symbols and the octal rule.	1	2
12	Chemical Bonding	a2,a3, b1,d1,d2	-Ionic bonding and size of ions. -Covalent bonding, bond polarity and electronegativity. -Drawing Lewis structures. And resonance structures.	1	2
13	Bonding theories	a2,a3, b1,d1,d2	-Exceptions to the octet rule, strengths of covalent bonds, and oxidation numbers. - Molecular Shapes, the VSEPR theory, polarity of molecules, and covalent bonding and orbital overlap. - Hybrid orbitals, multiple bond, and molecular orbitals.	1	2
14		a1, a2, a3,b1,b2, d1,d1,d2	General revision	1	2
15		a1, a2, a3,b1,b2, d1,d1,d2	Final Exam	1	2
Number of Weeks /and Units Per Semester				**16**	**32**

B – Practical Aspect:

Order	Tasks/ Experiments	Number of Weeks	contact hours	Learning Outcomes
1	Instructions and safety rules.	1	2	a1,b1,b2,

				c1,d1,d2
2	Measurements	1	2	a.2, a3, b1,b2, c1,d1,d2
3	Identification of a substance by physical properties.	2	4	a1, b1,b2,c1, d1,d2
4	Empirical formula of a compound.	1	2	a2,a3, b1,b2, c1,d1,d2
5	Formula of hydrate.	1	2	a2,a3, b1,b2, c1,d1,d2
6	Limiting reactant.	1	2	a2,a3, b1,b2, c1,d1,d2
7	Flame tests & electron configuration.	1	2	b1, c1,d.1, d2
8	Analysis of vinegar by titration.	1	2	b1,b2, c1,d.1 d2
9	Heat of a neutralization reaction.	1	2	b1,b2, c1,d.1 d2
10	Le Chatelier's principle.	1	2	b1,b2, c1,d.1 d2
11	General revision	1	2	a2,a3, b1,b2, c1,d1,d2
12	Final Practical Exam	1	2	b1,b2,c1, d1,d2
Number of Weeks /and Units Per Semester		**13**	**26**	

VI. Teaching strategies of the course:

- Lectures
- Practical classes
- Interactive class discussions
- Small group discussions
- Assignments

VII. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Changes of periodic properties for the representative group elements.	a1,a2,b1,d1,d2	5	2
2	Calculations of aqueous solutions using different units	a1,a3,b1,d1,d2	14	3
	Total			5

VIII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Quizzes	3,4,8,11,14	5	5%	a2,a3,b1,d1
2	Assignments	5,14	5	5%	a1,b2,d2,d3
3	Practical work and reports	2,5,7,9,12	10	10%	b1,b2,c1, d1,d2
4	Theoretical Mid- Term Exam	7	10	10%	a1,a2,a3, b1, b2, d1
5	Practical Final Exam	13	30	30%	b1,b2,c1, d1,d
6	Theoretical Final Exam	16	40	40%	a1,a.2, a3,a5, b1, b2, d1,d2
7	**Total**		100	100%	

IX. Learning Resources:

1- Required Textbook(s) (maximum two).

1- Chemistry, The Central Science, Brown, Lemay , Bursten and Murphy, Prentice Hall, 12th Edition (2012).

2- Essential References.

1- Course class notes.
2- General chemistry, Ebbing and Gammon, Houghton Mifflin, 9th edition, 2009.
3- Chemistry, change, McGraw Hill, 9th edition, 2007.
4- Chemistry, Zumdahl and Zumdahl, Houghton Mifflin, 7th edition, 2007.
5- Chemistry, The Molecular Nature of Matter and Change, Silberberg, McGraw Hill, 3ed edition, 2003.

3- Electronic Materials and Web Sites *etc.*

1- https://www.scribd.com/presentation/463736427/GeneralChemistry1-pptx
2- www.chem.duke.edu/-wwarren

X. Course Policies:

1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.

3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects**: - Assignments and projects will be assessed individually unless the teacher request for group work
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the faculty rules.
7	**Other policies**: -

Template for Course Plan (Syllabus) General Chemistry

I. Information about Faculty Member Responsible for the Course:

		Office Hours					
Name of Faculty Member							
Location& Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Identification and General Information:

1	Course Title:	General Chemistry				
2	Course Number & Code:	MED112				
3	Credit hours:	C.H				Total
		Th.	Seminar	Pr.	F. Tr.	
		2		1		3
4	Study level/year at which this course is offered:	First year- 1st semester				
5	Pre –requisite (if any):	None				
6	Co –requisite (if any):	None				
7	Program (s) in which the course is offered	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	Language of teaching the course:	English				
9	System of Study:	Semester				
10	Mode of delivery:	Regular				
11	Location of teaching the course:	Al-Saeed University Campus				

III. Course Description:

This course covers fundamentals of chemistry. It includes Introduction, Matter and Measurement, Atoms, Molecules, and Ions, Stoichiometry: Calculations with Chemical Formulas and Equations, Aqueous Reactions & Solution Stoichiometry, Thermochemistry, Electronic Structure of Atoms, Periodic Properties of the Elements, Basic Concepts of Chemical Bonding, Molecular Geometry and Bonding Theories. Students will be able to have knowledge and understanding of essential facts, concepts, theories and foundations of chemistry. They are also able to apply knowledge in performing some basic laboratory experiments.

IV. Course Objectives:

1- This introductory course is aimed to satisfy specifically the needs of pharmacy students.
2- Students will have the fundamentals of the main fields of chemistry and will be able to go through other courses like Organic, Analytical, Physical and Medicinal Chemistry.
3- Students will get the skills of scientific thinking and solving of problems.

V. Intended learning outcomes (ILOs) of the course:

Brief summary of the knowledge or skill the course is intended to develop:
Classify elements according to their electronic structure and understand how that affects periodic properties.
Understand the concepts of stoichiometry and line spectra their importance.
Comprehend the nature of aqueous chemical reactions and their properties.
Master unit conversion & basic chemical calculation.
Balance chemical equation and relate the reactants and product using stoichiomtery concept.
Handle chemicals in their various forms in a safe manner and use glassware and equipment appropriately.
Demonstrate critical thinking, problem-solving, decision making teem working and communication with others.
Perform online computer search to retrieve chemical information from a variety of sources.

VI. Course Content:

- Distribution of Semester Weekly Plan of Course Topics/Items and Activities.

A – Theoretical Aspect:

Order	Topics List	Week Due	Contact Hours
1	- The study of chemistry. - Properties of Matter. - Units of measurement. - Uncertainty in measurement. - Dimensional analysis.	1, 2	4
2	-The atomic theory of matter. -The discovery of atomic structure. -The modern view of atomic structure.	3	2
3	-The Periodic table and properties. -Molecules and molecular compounds. -Ions & Ionic compounds.	4	2
4	-Chemical equations and patterns of chemical reactivity. -Atomic and molecular weights and the mole. -Empirical formulas from analyses.	5	2
5	-Quantitative information from balanced equations. -Limiting reactants. - Solution composition and Properties of solutes in aqueous solution.	6	2

6	**Mid-Term exam**	7	2
7	-Acids, bases, salts and ionic equations. -Acids, bases and neutralization reaction. -Oxidation reduction reactions - Concentration of solutions - Solution Stoichiometry and Chemical analysis.	8	2
8	- Kinetic energy and potential energy and units of energy - Transferring of energy between system and surrounding -The first law of thermodynamics and Enthalpy. - Enthalpies of reaction - Calorimetry - Hess's law and Enthalpies of formation.	9	2
9	-The wave nature of light, quantified energy and photons.-Bohr's model of hydrogen atom and the wave behavior of matter. -Quantum mechanics and atomic orbitals. -Representation of atomic orbitals and molecular orbitals.	10	2
10	- Electron configuration. - Electron configuration and the periodic table. -Development of the periodic table and electron shells and the size of atoms.	11	2
11	-Ionization energy. - Electron affinity. -Lewis symbols and the octal rule.	12	2
12	-Ionic bonding and size of ions. -Covalent bonding, bond polarity and electronegativity. -Drawing Lewis structures. And resonance structures.	13	2
13	-Exceptions to the octet rule, strengths of covalent bonds, and oxidation numbers. - Molecular Shapes, the VSEPR theory, polarity of molecules, and covalent bonding and orbital overlap. - Hybrid orbitals, multiple bond, and molecular orbitals.	14	2
14	General revision	15	2
15	**Final Exam**	16	2

Number of Weeks /and Units Per Semester	16	32

B – Practical Aspect:

Order	Topics List	Week Due	Contact Hours
1	Instructions and safety rules.	1	2
2	Measurements	2	2
3	Identification of a substance by physical properties.	3, 4	4
4	Empirical formula of a compound.	5	2
5	Formula of hydrate.	6	2
6	Limiting reactant.	7	2
7	Flame tests & electron configuration.	8	2
8	Analysis of vinegar by titration.	9	2
9	Heat of a neutralization reaction.	10	2
10	Le Chatelier's principle.	11	2
11	General revision	12	2
12	**Final Practical Exam**	13	2
Number of Weeks /and Units Per Semester		**13**	**26**

VII. Teaching strategies of the course:

- Lectures
- Practical classes
- Interactive class discussions
- Small group discussions
- Assignments

No	Assignments	Week Due	Mark
1	Changes of periodic properties for the representative group elements.	5	2
2	Calculations of aqueous solutions using different units	14	3
3	**Total**		5

VIII. Schedule of Assessment Tasks for Students During the Semester:

Assessment	Type of Assessment Tasks	Week Due	Mark	Proportion of Final Assessment
1	Quizzes	3,4,8,11,14	5	5%
2	Assignments	5,14	5	5%
3	Practical work and reports	2,5,7,9,12	10	10%
4	Theoretical Mid- Term Exam	7	10	10%
5	Practical Final Exam	13	30	30%
6	Theoretical Final Exam	16	40	40%
7	**Total**		100	100%

IX. Learning Resources:

1- Required Textbook(s)

1- Chemistry, The Central Science, Brown, Lemay , Bursten and Murphy, Prentice Hall, 12th Edition (2012).

2- Essential References.

1- Course class notes.
2- General chemistry, Ebbing and Gammon, Houghton Mifflin, 9th edition, 2009.
3- Chemistry, change, McGraw Hill, 9th edition, 2007.
4- Chemistry, Zumdahl and Zumdahl, Houghton Mifflin, 7th edition, 2007.
5- Chemistry, The Molecular Nature of Matter and Change, Silberberg, McGraw Hill, 3ed edition, 2003.

3- Electronic Materials and Web Sites *etc*.

1- https://www.scribd.com/presentation/463736427/GeneralChemistry1-pptx
2- www.chem.duke.edu/-wwarren

X. Course Policies:

1	**Class Attendance:**

	- At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam.
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** - Assignments and projects will be assessed individually unless the teacher request for group work.
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course.
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:**

Course Specification of Orientation to Pharmacy

I. Course Identification and General Information:

1	Course Title:	Orientation to Pharmacy				
2	Course Code & Number:	PHA121				
3	Credit hours:	C.H				TOTAL
		Th.	Seminar	practical	Training.	
		1				1
4	Study level/ semester at which this course is offered:	1s year / 1st semester				
5	Pre –requisite (if any):	none				
6	Co –requisite (if any):	none				
7	Program (s) in which the course is offered:	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	Language of teaching the course:	English / Arabic				
9	Study System	Semester				
10	Mode of delivery:	Regular				
11	Location of teaching the course:	Al-Saeed University campus				
12	Prepared By:	Dr. Abdulkarim Kassem Alzomor				

II. Course Description:

This course aims to define the students with different roles of the pharmacist in the community and document the history of pharmacy through the different area. In addition, the course introduces pharmacy as an art and as profession to the newly admitted students in the pharmacy department. Also, this course provides the students with an introduction on pharmaceutical dosage form.

III. Course Objectives:

The aim of this course to:

1. Provide the students with information about the pharmacy and its field.
2. Provide the students with information about the history of pharmacy and its development.
3. Provide the students with information about the different pharmacopeia and uses.

IV.	Course Intended learning outcomes (CILOs) of the course	WRITE Symbol and number of PILOs
a.1	Explain the principles of basic pharmaceutical science and its development.	A1, A2

a.2	Define pharmacy and drug, classes of drugs, pharmacy education and career, information resources, and organizations.	**A1, A2, A4**
b.1	Classify the routes of drug administration and pharmaceutical dosage forms.	**B2**
b.2	Differentiate between different types of pharmacopeia for drug analysis.	**B2**
c.1	Prescribe the different types of pharmaceutical dosage form.	**C5**
d.1	Discus pharmaceutical problems and solve it in a scientific way.	**D1, 2**
d.2	Participate efficiently with colleagues in a team work	**D1**

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1- Explain the principles of basic pharmaceutical science and its development.	- Lectures - Presentations - Self - learning.	Quizzes, Written exam.
a2- Define pharmacy and drug, classes of drugs, pharmacy education and career, information resources, and organizations..		

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1. Classify the routes of drug administration and pharmaceutical dosage forms.	- Lectures, - Discussions - Brain Storming	- Achievement tests (Written Tests) - Oral Tests
b2. Differentiate between different types of pharmacopeia for drug analysis.		

(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1. Prescribe the different types of pharmaceutical dosage form.	- Lectures, presentation - Problem solving - Cooperative &. Self – learning	Reports' Evaluation.

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1. Discus pharmaceutical problems and	- Group discussions	- Homework

solve it in a scientific way. d2. Participate efficiently with colleagues in a team work.	- Cooperative learning. - Self – learning	Evaluation. - Oral Presentation & discussion

V. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	contact hours
1	Introduction in Pharmacy Orientation	a1, a2, b1, b2	- Defines: drug, pharmacy, raw material, dosage form, toxicology, dose, …ect. - Symbols of Pharmacy. - Pharmacy are: (Science, Art and Business) - Pharmacy Departments and Subjects. - Field of pharmacy worker.	2	2
2	تاريخ الصيدلة في الحضارات القديمة حتى عرب الجاهلية الصيدلة في مرحلة ما قبل التاريخ	a1, a2, b1, d1, d2	▪ الصيدلة في بلاد ما بين النهرين. ▪ الصيدلة عند قدماء المصريين. ▪ الصيدلة في بلاد الشام القديمة. ▪ الصيدلة عند قدماء الصنين. ▪ الصيدلة عند قدماء الهنود. ▪ الصيدلة عند اليونانيين.	2	2
3	تطور الصيدلة في الحضارة العربية الإسلامية	a1, a2, b1, d1, d2	▪ تطور الصيدلة في صدر الإسلام ▪ تطور الصيدلة في العصر الأموي ▪ تطور الصيدلة في العصر العباسي ▪ الأقرباذينات و البيمارستانات في الحضارة الإسلامية	2	2
4	• Mid-term exam			1	1
5	Pharmacy education	a1, a2, b1, b2, c1, d1, d2	-Pharmacy education and pharmacy career -Pharmacy ethics, drug information resources, and Pharmaceutical organizations	2	2
6	pharmaceutical dosage forms	a1, a2, b1, b2, c1, d1, d2	-Definitions. -Classification of pharmaceutical dosage forms with examples. -Dosage form design, selection of the proper dosage forms, -Types of pharmaceutical dosage forms, advantages and disadvantage.	5	5

			-Routes of drug administration.		
7	Pharmacopoeias	a2, a2, b1, c1, d2.	- Definition. - Types of Pharmacopeias - Differences between types of Pharmacopeias. - Important of Pharmacopeias - Uses of Pharmacopeias.	1	1
8	Final exam	a1,a2, b1, b2 c1, d1, d2		1	1
Number of Weeks /and Units Per Semester				**16**	**16**

VI. Teaching strategies of the course:

- Lectures and presentation.
- Discussions
- Brain Storming
- Problem solving
- Self – learning
- Group discussions
- Cooperative learning

VII. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Class attendance and participation	**a1, a2,b1, c1, d1.**	weekly	5
2	Reports on the of history of pharmacy field.	**a1, a2, b1, b2, d2**	10	5
	Total Score			**10**

VIII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Tasks and Assignments	**Weekly**	10	**10%**	**a1, a2, b1, b1, c1, d1, d2**
2	Midterm Exam	**W7**	20	**20%**	**a1, a2, b1, b2, d1**
3	Final Exam (theoretical)	**W16**	70	**70%**	**a1, a2, b1, b2, c1, d1, d2**
Total			100	100%	

IX. Learning Resources:

1- Required Textbook(s)

1. Ben J Whalley; Kate E Fletcher; Sam E Weston; Rachel L Howard and Clare F Rawlinson, (2008)., Foundation in Pharmacy Practice.
2. Ruth E. Nermire, Karen L. Kier, McGraw Hill, (2009). Pharmacy student Survival Guide, Second edition

2- Essential References.

1. Arthur J. Winfield, R. Michael E, Richards; 2009. Pharmaceutical practice, Fourth edition, Churchill Livingstone.
2. Loyd v. Allen, Nicholas G. Popovich and Haward C. Ansel's, 2004. Pharmaceutical dosage forms and drug delivery Systems, Lippincott Williams and Wilkins

3- Electronic Materials and Web Sites *etc.*

1-http://betterpharmacytech.com/about-us/pms/
2-http://www.pharmacy.wsu.edu/history/history01.html

X.Course Policies:

1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects**: - Assignments and projects will be assessed individually unless the teacher request for group work
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the faculty rules.
7	**Other policies**:

Template for Course Plan (Syllabus) of Orientation to Pharmacy

I. Information about Faculty Member Responsible for the Course:

		Office Hours					
Name of Faculty Member							
Location& Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Identification and General Information:

1	Course Title:	Orientation to Pharmacy				
2	Course Code & Number:	PHA121				
3	Credit hours:	C.H				TOTAL
		Th.	Seminar	practical	Training.	
		1				1
4	Study level/ semester at which this course is offered:	1s year / 1st semester				
5	Pre –requisite (if any):	none				
6	Co –requisite (if any):	none				
7	Program (s) in which the course is offered:	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	Language of teaching the course:	English / Arabic				
9	Study System	Semester				
10	Mode of delivery:	Regular				
11	Location of teaching the course:	Al-Saeed University campus				

III. Course Description:

This course aims to define the students with different roles of the pharmacist in the community and document the history of pharmacy through the different area. In addition, the course introduces pharmacy as an art and as profession to the newly admitted students in the pharmacy department. Also, this course provides the students with an introduction on pharmaceutical dosage form.

IV. Course Objectives:

The aim of this course to:

1. Provide the students with information about the pharmacy and its field.
2. Provide the students with information about the history of pharmacy and its development.
3. Provide the students with information about the different pharmacopeia and uses.

V. Intended learning outcomes (ILOs) of the course:

- Brief summary of the knowledge or skill the course is intended to develop:

1- Explain the principles of basic pharmaceutical science and its development.
2- Define pharmacy and drug, classes of drugs, pharmacy education and career, information resource and organizations.
3- Classify the routes of drug administration and pharmaceutical dosage forms.
4- Differentiate between different types of pharmacopeia for drug analysis.
5- Prescribe the different types of pharmaceutical dosage form.
6- Discus pharmaceutical problems and solve it in a scientific way.
7- Participate efficiently with colleagues in a team work

VI. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Sub Topics List	Week Due	contact hours
1	Introduction in Pharmacy Orientation	- Defines: drug, pharmacy, raw material, dosage form, toxicology, dose, …ect. - Symbols of Pharmacy.	W1	2
		- Pharmacy are: (Science, Art and Business) - Pharmacy Departments and Subjects. - Field of pharmacy worker.	W2	
2	تاريخ الصيدلة في الحضارات القديمة حتى عرب الجاهلية الصيدلة في مرحلة ما قبل التاريخ	▪ الصيدلة في بلاد ما بين النهرين. ▪ الصيدلة عند قدماء المصريين. ▪ الصيدلة في بلاد الشام القديم	W3	2
		▪ الصيدلة عند قدماء الصنين. ▪ الصيدلة عند قدماء الهنود. ▪ الصيدلة عند اليونانيين.	W4	
3	تطور الصيدلة في الحضارة العربية الإسلامية	▪ تطور الصيدلة في صدر الإسلام ▪ تطور الصيدلة في العصر الأموي	W5	2
		▪ تطور الصيدلة في العصر العباسي ▪ الأقرباذينات و البيمارستانات في الحضارة الإسلامية	W6	
4	Mid-term exam		W7	1
5	Pharmacy education	-Pharmacy education and pharmacy career	W8	2

		-Pharmacy ethics, drug information resources, and Pharmaceutical organizations	W9	
6	pharmaceutical dosage forms	-Definitions. -Classification of pharmaceutical dosage forms with examples.	W10 &W11	5
		-Dosage form design, selection of the proper dosage forms,	W12	
		-Types of pharmaceutical dosage forms, advantages and disadvantage.	W13	
		-Routes of drug administration.	W14	
7	Pharmacopoeias	- Definition. - Types of Pharmacopeias - Differences between types of Pharmacopeias. - Important of Pharmacopeias - Uses of Pharmacopeias.	W15	1
8	Final exam		W16	1
Number of Weeks /and Units Per Semester			**16**	**16**

VII. Teaching strategies of the course:

- Lectures and presentation.
- Discussions
- Brain Storming
- Problem solving
- Self – learning
- Group discussions
- Cooperative learning

VIII. Assignments:

No	Assignments	Week Due	Mark
1	Class attendance and participation	weekly	5
2	Reports on the of history of pharmacy field.	10	5
	Total Score		**10**

IX. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment
1	Tasks and Assignments	**Weekly**	10	**10%**
2	Midterm Exam	**W7**	20	**20%**
3	Final Exam (theoretical)	**W16**	70	**70%**
Total			100	100%

X. Learning Resources:

1- Required Textbook(s) (maximum two).

1. Ben J Whalley; Kate E Fletcher; Sam E Weston; Rachel L Howard and Clare F
   a. Rawlinson, (2008)., Foundation in Pharmacy Practice.
2. Ruth E. Nermire, Karen L. Kier, McGraw Hill, (2009). Pharmacy student Survival Guide, Second edition

2- Essential References.

1. Arthur J. Winfield, R. Michael E, Richards; 2009. Pharmaceutical practice, Fourth edition, Churchill Livingstone.
2. Loyd v. Allen, Nicholas G. Popovich and Haward C. Ansel's, 2004. Pharmaceutical dosage forms and drug delivery Systems, Lippincott Williams and Wilkins

3- Electronic Materials and Web Sites *etc.*

1-http://betterpharmacytech.com/about-us/pms/
2-http://www.pharmacy.wsu.edu/history/history01.html

XI. Course Policies:

1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam.
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** - Assignments and projects will be assessed individually unless the teacher request for group work.
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course.
6	**Plagiarism**:

	Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:**

First Level, Seconed Semester

Course Specification of Arabic Language 2

I. معلومات عامة عن المقرر:						
1	اسم المقرر:	Arabic Language 2				
2	رمز المقرر ورقمه:	ARB 102				
3	الساعات المعتمدة:	محاضرة	سمنار	عملي	تدريب	الإجمالي
		2	-	-	-	2
4	المستوى والفصل الدراسي:	المستوى : الأول- الفصل: الثاني				
5	المتطلبات السابقة لدراسة المقرر (إن وجدت):	اللغة العربية 101				
6	المتطلبات المصاحبة (إن وجدت):	لا يوجد				
7	البرنامج الذي يدرس له المقرر:	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	لغة تدريس المقرر:	اللغة العربية				
9	نظام الدراسة:	فصلي				
10	معدّا مواصفات المقرر:	د. أحمد عثمان ناجي المخلافي د. جلال الحمادي.				

II. وصف المقرر:
هذا المقرَّراللغة العربية (102) مُتَمّمٌ لمحتوى المقرّر السابق اللغة العربية (101)، وسيتناول الحروف الناسخة دلالاتها وعملها، والفعل المتعدي واللازم، والأحكام الإعرابية للفاعل ونائبه، والمفعولات، والتمييز، وكتابة الأعداد، والأحكام الإعرابية لأسلوبي النداء والاستثناء والتوابع. كما يتناول تعريفًا بالمعاجم العربية، وكيفية الكشف فيها. ويتناول أيضًا نصوصًا شعرية رفيعة من شعرنا العربي تعكس جمال لغتنا العربية، فضلا عن التطبيقات اللغوية المختلفة، وعن تحليل النصوص تحليلا لغويًّا وبلاغيًّا، وذلك بطريقة تُعزِّز حُبَّ اللغة العربية في نفس الطالب، وتُنمي قدراته اللغوية والبلاغية، وتُعمّق قدراته على ممارسة المهارات النحوية والكتابية وتطبيق القواعد النحوية في حياته العملية. ويُعدُّ مقرر اللغة العربية(102) مُتطلّبًا جامعيًّا لجميع طلاب الجامعات الحكومية والأهلية في الجمهورية اليمنية.

III. أهداف المقرر:
يهدف هذا المقرّر إلى: - ترسيخ ما سبق أن اكتسبه الطالب من معارف لغوية ومهارات كتابية ولغوية، وتنميتها، ليتمكن من أن يؤدي عبارة خالية من الأخطاء. - إكساب الطالب اتجاهات إيجابية نحو استخدام القواعد النحوية والكتابية وتطبيقها في حياته العملية. - تنمية قدرة الطالب في تحليل النصوص اللغوية، والكشف عن مواطن الجمال الفني فيها. - إلمام الطالب بالحروف الناسخة وعملها، وعلى عناصر كل من: الجملة الفعلية، وأسلوبي النداء والاستثناء، وعلى المعاجم العربية القديمة والحديثة، وعلى عدد من الشعراء ونماذج رفيعة من شعرهم. - إدراك الطالب الأحكام الإعرابية الخاصة بالفاعل، ونائبه، والمفعولات، والمنادى، والمستثنى، والتوابع، والتمييز. - تمكُّن الطالب من إنشاء تراكيب لغوية صحيحة، ومن الكشف عن معاني الكلمات في المعاجم العربية. - زيادة الثروة اللغوية للطالب، ورفع أدائه اللغوي العام. - التفريق بين الطالب بين عمل الأفعال الناسخة والحروف الناسخة، وبين الفاعل ونائبه، والفعل المبني للمعلوم والمبني للمجهول، وبين نوعي التمييز، وتمييز العدد المفرد والمركب والمعطوف، وبين العدد المذكر والمؤنّث. - اكساب الطالب مهارات القراءة الصحيحة، والفهم والاستيعاب، والحوار، والتحدث بالعربية الفصحى.

مخرجات التعلم:		
(A) المعرفة والفهم		
موائمة مخرجات تعلم المقرر مع مخرجات تعلم البرنامج		
مخرجات تعلم البرنامج (المعرفة والفهم)		
بعد الانتهاء من البرنامج، سيكون الطالب قادرا على أن:		
A1	يظهرر المعرفة والفهم للحروف الناسخة، والفاعل ونائبه، والمفعولات والتمييز، والتوابع، والمنادى والمستثنى.	a.1
	يظهر المعرفة والفهم للأحكام الإعرابية لكل من: الحروف الناسخة، والفاعل ونائبه والمفعولات والتمييز والتوابع، والمنادى والمستثنى.	a.2
	يعرف النصوص الشعرية الجديدة وشعرائها، ومضامينها وأغراضها الشعرية.	a.3
(B) المهارات الذهنية		
موائمة مخرجات تعلم المقرر مع مخرجات تعلم البرنامج		
مخرجات تعلم البرنامج (المهارات الذهنية)		
بعد الانتهاء من البرنامج، سيكون الطالب قادرا على أن:		
B3	يفريق بين الفاعل ونائبه، وبين أنواع التوابع، وأنواع المفعولات، وتذكير العدد وتأنيثه، وبين أنواع المنادى، وكذلك عمل الأفعال الناسخة وعمل الحروف الناسخة	b.1
	يميز الأحكام الإعرابية لكل من: اسم الحرف الناسخ وخبره، والفاعل ونائبه والمفعولات والتوابع والتمييز والمنادى والمستثنى وانتاج جمل فعلية صحيحة.	b.2

(C) المهارات المهنية والعملية		
موائمة مخرجات تعلم المقرر مع مخرجات تعلم البرنامج		
مخرجات تعلم البرنامج (المهارات المهنية والعملية)		
بعد الانتهاء من البرنامج، سيكون الخريج قادرا على أن		
C3	يقرأ القراءة الصحيحة للنصوص ويحليلها تحليلا لغويًا.	c.1
	ينطق المطق السليم لتمييز العدد، وللعدد تذكيرًا وتأنيثًا.	c.2
(D) المهارات العامة		
موائمة مخرجات تعلم المقرر مع مخرجات تعلم البرنامج		
مخرجات تعلم البرنامج (المهارات العامة)		
بعد الانتهاء من البرنامج، سيكون الخريج قادرh على أن :		
D1	يعرض أفكاره ويتواصل مع الآخرين بوضوح كتابة أو شفهيا	d.1
D3	يطور قدراته الذاتية من مصادر التعليم المختلفة	d.2

(C) ربط مخرجات التعلم باستراتيجيات التدريس والتقييم		
أولا: ربط مخرجات تعلم المقرر (المعرفة والفهم) باستراتيجية التدريس والتقييم:		
مخرجات المقرر / المعرفة والفهم	**استراتيجية التدريس**	**استراتيجية التقويم**
a1 – يظهر المعرفة والفهم للحروف الناسخة، والفاعل ونائبه، والمفعولات والتمييز، والتوابع، والمنادى والمستثنى.	المحاضرة – الحوار والمناقشة.	الاختبارات التحريرية والشفوية- التطبيقات النحوية وحل التمارين- الملاحظة.
a2 –يظهر المعرفة والفهم للأحكام الإعرابية لكل من: الحروف الناسخة، والفاعل ونائبه والمفعولات والتمييز والتوابع، والمنادى والمستثنى.	المحاضرة-المناقشة والحوار- الاستنباط .	الاختبارات التحريرية والشفوية-حل التمارين - الواجبات والتكاليف – المشاركة في المناقشات.
a3 –يعرف النصوص الشعرية الجديدة وشعرائها، ومضامينها وأغراضها الشعرية.	المحاضرة والعرض -الحوار والمناقشة- الاستنباط.	الاختبارات التحريرية والشفوية. الواجبات والتكاليف.

ثانيا: ربط مخرجات تعلم المقرر (المهارات الذهنية) باستراتيجية التدريس والتقييم:		
مخرجات المقرر/ المهارات الذهنية	**استراتيجية التدريس**	**استراتيجية التقويم**
b1 –يفريق بين الفاعل ونائبه، وبين أنواع التوابع، وأنواع المفعولات، وتذكير العدد وتأنيثه، وبين أنواع المنادى، وكذلك عمل الأفعال الناسخة وعمل الحروف الناسخة	المحاضرة الحوار والمناقشة - التطبيقات العملية نطقًا وكتابة.	الاختبارات الشفوية والتحريرية- التطبيقات النحوية وحل التمارين- الواجبات والتكاليف.
b2 –يميز الأحكام الإعرابية لكل من: اسم الحرف الناسخ وخبره، والفاعل ونائبه والمفعولات والتوابع والتمييز والمنادى والمستثنى وانتاج جمل فعلية صحيحة.	المحاضرة – المناقشة والحوار- التطبيقات اللغوية- إدارة حوار تمثيلي بلغة فصيحة.	الملاحظة- حل التمارين- الاختبارات التحريرية والشفوية.

ثالثا: ربط مخرجات تعلم المقرر (المهارات المهنية والعملية) باستراتيجية التدريس والتقييم:		
مخرجات المقرر/ المهارات المهنية والعملية	**استراتيجية التدريس**	**استراتيجية التقويم**
c1 - يقرأ القراءة الصحيحة للنصوص ويحليلها تحليلا لغويًا.	المحاضرة- الحوار والمناقشة- التطبيقات العملية	الاختبارات التحريرية والشفوية- حل التمارين- المشاركة في النقاشات.
c2- ينطق المطق السليم لتمييز العدد، وللعدد تذكيرًا وتأنيثًا.	تطبيقات لغوية- الحوار والمناقشة.	الاختبارات التحريرية والشفوية.

رابعا: ربط مخرجات تعلم المقرر (المهارات العامة) باستراتيجية التدريس والتقييم:		
مخرجات المقرر	**استراتيجية التدريس**	**استراتيجية التقويم**
d1 - يعرض أفكاره ويتواصل مع الآخرين بوضوح كتابة أو شفهيا	التكاليف المباشرة في أثناء المحاضرة والتكاليف المنزلية.	الواجبات و التكاليف.
d2 -يطور قدراته الذاتية من مصادر التعليم المختلفة	العرض لنصوص أدبية رفيعة، ومناقشة تطبيقات لغوية تُبرز جمال اللغة العربية وأهمية تعلمها.	الملاحظة- والأسئلة المباشرة

خامساً: كتابة مواضيع المقرر الرئيسة والفرعية (النظرية والعملية) وربطها بمخرجات التعلم المقصودة للمقرر مع تحديد الساعات المعتمدة لها.

كتابة وحدات /مواضيع محتوى المقرر

أولا: الجانب النظري

الرقم	وحدات/ موضوعات المقرر	المواضيع التفصيلية	عدد الأسابيع	الساعات الفعلية	مخرجات تعلم المقرر
1	الحروف النواسخ	- (إنّ) وأخواتها - (لا) النافية للجنس و(ما) العاملة (ليس)	2	4	a1,a2
2	الجملة الفعلية	- الفعل اللازم والمتعدي - الفاعل - نائب الفاعل - المفعول به -المفعول المطلق المفعول لأجله	2	4	a1,a2,a,3b1,b2
3	نص شعري	من قصيدة (نكبة دمشق) لأمير الشعراء أحمد شوقي	1	2	a1, a2, a3, b1, b2, c1, c,2
4	تقييم	اختبار نصف الفصل	1	2	a1,a2,a3,b1,b2,c1,c,2,d1
5	التوابع	النعت- التوكيد- العطف- البدل	2	4	a1, a2, a3, b1, b2, c1c,2
6	التمييز	- نوعا التمييز - تمييز العدد- تذكير العدد وتأنيثه	1	2	a1,a2,a3,b1,b2,c1,c,2
7	المعجم العربي	تاريخ المعاجم العربية وأهميتها – أنواعها – كيفية الكشف فيها عن دلالات الألفاظ.	1	2	a1,a2,a3,b1,b2,c1,c,2,d1,d2
8	نص شعري	(عتاب ووعيد) للشاعر عبدالله البردّوني	1	2	a1, a2, a3, b1, b2, c1, c,2, d1, d2

9	أسلوب النداء	-عناصر أسلوب النداء - حروف النداء -أنواع المنادى	1	2	a1,a2,a3,b1,b2
10	أسلوب الاستثناء	-عناصر أسلوب الاستثناء- أدوات الاستثناء- حكم المستثنى بعد (إلا) و(غير) و(سوى) و(عدا) و(خلا) و(حاشا).	1	2	a1,a2,a3,b1,b2
11	نص شعري	قصيدة (العودة) للشاعر إبراهيم ناجي	1	2	a1,a2,a3,b1,b2,c1,c,2,d1,d2.
إجمالي الأسابيع والساعات			14	28	

ثانيا: الجانب العملي:

تكتب تجارب (مواضيع) العملي

الرقم	التجارب العملية	عدد الأسابيع	الساعات الفعلية	مخرجات التعلم
.				
.				
.				
.				
إجمالي الأسابيع والساعات				

ثالثا: استراتيجية التدريس:
المحاضرة
الحوار والمناقشة.
الاستنباط
التعلم التعاوني
إدارة الحوار التمثيلي
التطبيقات العملية
العروض التقديمية
حل المشكلات
التعلم التعاوني

الأنشطة والتكليفات:

الرقم	النشاط / التكليف	مخرجات التعلم	الأسبوع	الدرجة
1	حل التمارين والواجبات النحوية	a1,a2,a3,b1,b2,c1,c,2,d1,d2	1-14	5
2	يكلّف كل طالب باختيار وجه واحد من المصحف الشريف ويحلله تحليلا نحويًّا، فيستخرج الأفعال وأفعالها ومفاعيلها، والنواسخ ومعمولاتها	a1,a2,a3,b1,b2,c1,c,2,d1,d2	6	5
3	اختر قصيدة أعجبتك للشاعر عبدالله البردوني، وحللها تحليلا لغويًّا وبلاغيًّا.	a1,a2,a3,b1,b2,c1,c,2,d1,d2	11	5

تقييم التعلم:

الرقم	أنشطة التقييم	الأسبوع	الدرجة	نسبة الدرجة إلى درجة التقويم النهائي	المخرجات التي يحققها
1	تطبيقات، واجبات، تمارين عملية.	1-14	5	%5	A1,a2b1,b2,b3,b4,c1,c2,c3,d2,d3.
2	التكاليف والأنشطة	6, 11	5	%5	A3,b3,c1,d1,d3.
3	اختبار نصف الفصل الدراسي	7	20	%20	a1,a2,a3,b1,b2,c1,c,2,d1,d2
5	اختبار آخر الفصل الدراسي	16	70	%70	a1,a2,a3,b1,b2,c1,c,2,d1,d2

مصادر التعلم:
(اسم المؤلف، سنة النشر، اسم الكتاب، دار النشر، بلد النشر).
المراجع الرئيسة: (لا تزيد عن مرجعين)
1. د.علي المخلافي وآخرون- 2004-اللغة العربية (101) و(102) مكتبة الجيل الجديد - صنعاء . 2. د.محمد حماسة عبداللطيف وآخران-1997م النحو الأساسي – دار الفكر العربي- القاهرة.
المراجع المساعدة
1. السيد أحمد الهاشمي – (ت.ذ.ط). المفرد العلم في رسم القلم – دار الكتب العلمية- بيروت 2. محمد العدناني -1998 –ط. الثانية- معجم الأغلاط اللغوية المعاصرة- مكتبة لبنان – بيروت. 3. د.محمود سليمان ياقوت-2012-ط1-أسس اللغة العربية لطلاب الجامعات-دار عباد الرحمن-القاهرة ودار ابن حزم-بيروت
مواد إلكترونية وإنترنت: (إن وجدت)
1- كتب إلكترونية كمعجم المعاني عربي عربي 2- المكتبة الشاملة 3- مواقع لغوية، كموقع الألوكة، ومكتبة المصطفى، وموقع اللغة العربية تعلمًا وتعليمًا، وعجائب من العربية، وفنون اللغة العربية ومقهى اللغة العربية.

I.	Course Policies:
1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects**: - Assignments and projects will be assessed individually unless the teacher request for group work
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the faculty rules.

Template for Course Plan (Syllabus) Arabic Language 2

I. معلومات عن مدرس المقرر:							
الاسم		الساعات المكتبية (3/ أسبوعيا)					
المكان ورقم الهاتف		السبت	الأحد	الاثنين	الثلاثاء	الأربعاء	الخميس
البريد الإلكتروني							

II. معلومات عامة عن المقرر:						
.1	اسم المقرر:	Arabic Language 2				
.2	رمز المقرر ورقمه:	ARB 102				
.3	الساعات المعتمدة للمقرر:	الساعات				المجموع
		نظري	سمنار	عملي	تدريب	
		2	-	-	-	2
.4	المستوى والفصل الدراسي:	المستوى الأول-الفصل الثاني				
.5	المتطلبات السابقة لدراسة المقرر(إن وجدت):	اللغة العربية101				
.6	المتطلبات المصاحبة لدراسة المقرر(إن وجدت):	لا يوجد				
.7	البرنامج/ البرامج التي يتم فيها تدريس المقرر:	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
.8	لغة تدريس المقرر:	اللغة العربية				
.9	مكان تدريس المقرر:	قاعات الجامعة				

III. وصف المقرر الدراسي:

هذا المقرَّر (اللغة العربية102) مُتَمّمٌ لمحتوى المقرّر السابق اللغة العربية(101)، وسيتناول الحروف الناسخة دلالاتها وعملها، والفعل المتعدي واللازم، والأحكام الإعرابية للفاعل ونائبه، والمفعولات، والتمييز، وكتابة الأعداد، والأحكام الإعرابية لأسلوبي النداء والاستثناء والتوابع. كما يتناول تعريفًا بالمعاجم العربية، وكيفية الكشف فيها.

ويتناول أيضًا نصوصًا شعرية رفيعة من شعرنا العربي تعكس جمال لغتنا العربية، فضلا عن التطبيقات اللغوية

المختلفة، وعن تحليل النصوص تحليلا لغويًّا وبلاغيًّا، وذلك بطريقة تُعزِّز حُبَّ اللغة العربية في نفس الطالب، وتُنمي قدراته اللغوية والبلاغية، وتُعمّق قدراته على ممارسة المهارات النحوية والكتابية وتطبيق القواعد النحوية في حياته العملية.
ويُعدُّ مقرر اللغة العربية(102) مُتطلّبًا جامعيًّا لجميع طلاب الجامعات الحكومية والأهلية في الجمهورية اليمنية.

IV. أهداف المقرر:

يهدف هذا المقرّر إلى:

- ترسيخ ما سبق أن اكتسبه الطالب من معارف لغوية ومهارات كتابية ولغوية، وتنميتها، ليتمكن من أن يؤدي عبارة خالية من الأخطاء.
- إكساب الطالب اتجاهات إيجابية نحو استخدام القواعد النحوية والكتابية وتطبيقها في حياته العملية.
- تنمية قدرة الطالب في تحليل النصوص اللغوية، والكشف عن مواطن الجمال الفني فيها.
- إلمام الطالب بالحروف الناسخة وعملها، وعلى عناصر كل من: الجملة الفعلية، وأسلوبي النداء والاستثناء، وعلى المعاجم العربية القديمة والحديثة، وعلى عدد من الشعراء ونماذج رفيعة من شعرهم.
- إدراك الطالب الأحكام الإعرابية الخاصة بالفاعل، ونائبه، والمفعولات، والمنادى، والمستثنى، والتوابع، والتمييز.
- تمكُّن الطالب من إنشاء تراكيب لغوية صحيحة، ومن الكشف عن معاني الكلمات في المعاجم العربية.
- زيادة الثروة اللغوية للطالب، ورفع أدائه اللغوي العام.
- التفريق بين الطالب بين عمل الأفعال الناسخة والحروف الناسخة، وبين الفاعل ونائبه، والفعل المبني للمعلوم والمبني للمجهول، وبين نوعي التمييز، وتمييز العدد المفرد والمركب والمعطوف، وبين العدد المذكر والمؤنّث.
- اكساب الطالب مهارات القراءة الصحيحة، والفهم والاستيعاب، والحوار، والتحدث بالعربية الفصحى.

V. مخرجات التعلم المقصودة للمقرر:

بعد الانتهاء من المقرر، سيكون الطالب قادرا على أن:

- يظهر المعرفة والفهم للحروف الناسخة، والفاعل ونائبه، والمفعولات والتمييز، والتوابع، والمنادى والمستثنى.
- يظهر المعرفة والفهم للأحكام الإعرابية لكل من: الحروف الناسخة، والفاعل ونائبه والمفعولات والتمييز والتوابع، والمنادى والمستثنى.
- يعرف النصوص الشعرية الجديدة وشعرائها، ومضامينها وأغراضها الشعرية.
- يفريق بين الفاعل ونائبه، وبين أنواع التوابع، وأنواع المفعولات، وتذكير العدد وتأنيثه، وبين أنواع المنادى، وكذلك عمل الأفعال الناسخة وعمل الحروف الناسخة
- يميز الأحكام الإعرابية لكل من: اسم الحرف الناسخ وخبره، والفاعل ونائبه والمفعولات والتوابع والتمييز والمنادى والمستثنى وانتاج جمل فعلية صحيحة.
- يقرأ القراءة الصحيحة للنصوص ويحليلها تحليلا لغويًا.
- ينطق المطق السليم لتمييز العدد، وللعدد تذكيرًا وتأنيثًا.
- يعرض أفكاره ويتواصل مع الآخرين بوضوح كتابة أو شفهيا

- يطور قدراته الذاتية من مصادر التعليم المختلفة.

VI. محتوى المقرر:

الجانب النظري:

الرقم	وحدات المقرر	المواضيع التفصيلية	الأسبوع	الساعات الفعلية
-1	الحروف النواسخ	-(إنّ) وأخواتها -(لا) النافية للجنس و(ما) العاملة (ليس)	2	4
-2	الجملة الفعلية	-الفعل اللازم والمتعدي -الفاعل -نائب الفاعل - المفعول به-المفعول المطلق- المفعول لأجله	2	4
-3	نص شعري	من قصيدة (نكبة دمشق) لأمير الشعراء أحمد شوقي	1	2
-4	تقييم	اختبار نصف الفصل	1	2
-5	التوابع	النعت- التوكيد- العطف- البدل	2	4
-6	التمييز	-نوعا التمييز - تمييز العدد- تذكير العدد وتأنيثه	1	2
-7	المعجم العربي	تاريخ المعاجم العربية وأهميتها – أنواعها –كيفية الكشف فيها عن دلالات الألفاظ.	1	2
-8	نص شعري	(عتاب ووعيد) للشاعر عبدالله البردّوني	1	2
-9	أسلوب النداء	-عناصر أسلوب النداء - حروف النداء -أنواع المنادى	1	2
-10	أسلوب الاستثناء	-عناصر أسلوب الاستثناء- أدوات الاستثناء- حكم المستثنى بعد (إلا) و(غير) و(سوى) و(عدا) و(خلا) و(حاشا).	1	2
-11	نص شعري	قصيدة (العودة) للشاعر إبراهيم ناجي	1	2
		عدد الأسابيع والساعات	**14**	**28**

VII. استراتيجية التدريس:
المحاضرة
الحوار والمناقشة.
الاستنباط
التعلم التعاوني
إدارة الحوار التمثيلي
التطبيقات العملية
العروض التقديمية
حل المشكلات
التعلم التعاوني

VIII. الأنشطة والتكاليف

الرقم	النشاط / التكليف	الأسبوع	الدرجة
1	حل التمارين والواجبات النحوية	1-14	5
2	يكلّف كل طالب باختيار وجه واحد من المصحف الشريف ويحلله تحليلا نحويًّا، فيستخرج الأفعال وأفعالها ومفاعيلها، والنواسخ ومعمولاتها	6	2.5
3	اختر قصيدة أعجبتك للشاعر عبدالله البردوني، وحللها تحليلا لغويًّا وبلاغيًّا.	11	2.5

IX. تقييم التعلم:

الرقم	موضوعات التقويم	موعد التقويم/ اليوم والتاريخ	الدرجة	الوزن النسبي (نسبة الدرجة إلى درجة التقويم النهائي)
.1	تطبيقات، واجبات، تمارين عملية.	1-14	5	5%
.2	التكاليف والواجبات	6, 11	5	5%
.3	اختبار نصف الفصل الدراسي	7	20	20%
.4	اختبار آخر الفصل الدراسي	16	70	70%

X. صادر التعلم:

1. **المراجع الرئيسة:**
   - كتابة المرجع الرئيس للمقرر (اثنان على الأكثر).
   - يمكن في حال عدم توفر مرجع واحد لتغطية محتوى المقرر الدراسي إضافة مرجع آخر للضرورة القصوى (*اختياري*)

2.	المراجع المساعدة:
3.	مواد إلكترونية وإنترنت: (إن وجدت)

X.Course Policies:	
1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects**: - Assignments and projects will be assessed individually unless the teacher request for group work
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the faculty rules.
7	**Other policies**: -

Course Specification of English Language(2)

I. Course Identification and General Information:

1	**Course Title:**	**English Language2**				
2	**Course Code & Number:**	**ENG102**				
3	**Credit hours:**	C.H				TOTAL
		Th.	Seminar	practical	Training.	
		2				2
4	**Study level/ semester at which this course is offered:**	First Level, Second Semester				
5	**Pre –requisite (if any):**	English Language1				
6	**Co –requisite (if any):**					
7	**Program (s) in which the course is offered:**	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	**Language of teaching the course:**	English				
9	**Study System**	Semester				
10	**Mode of delivery:**	Regular				
11	**Location of teaching the course:**	Faculty of medical and Health sciences, Al-Saeed University				
12	**Prepared By:**					

II. Course Description:

This course is a skill-based course that focuses on developing the general and academic language skills of the students. The course builds on what the students have achieved in ENG101. It continues to develop the students' language skills and competencies by exposing them to a variety of general and academic contexts at Preintermediate and Intermediate language levels. In addition, the course builds the students' ability in the language use area through equipping them with a wide range of vocabulary and grammatical structures like the perfective, passive/active voices, conditional sentences, and reported speech. After that the students will be introduced to sentence structure starting with the main differences between phrases, dependent and independent clauses, and sentence patterns and types as prerequisites to master short paragraph text comprehension and paragraph writing. The focus will be on paragraph layout and paragraph basic elements like topic sentence, main ideas, supporting details, conclusion, cohesion, coherence, and unity. Moreover, the course develops the learners' cognitive skills such as analyzing, criticizing, synthesizing, and evaluating which are needed by the students at the university stage.

III. Course Objectives:

By the end of the course students would be able to:

1- Develop general and academic language skills.
2- Equip with some advanced topics in grammar that will help them in developing their writing skill.
3- Prepare for paragraph writing through the study of phrases and clauses, and then through the teaching of different patterns of sentences.
4- Introduce paragraph layout and structure

IV.	Course Intended learning outcomes (CILOs) of the course	WRITE Symbol and numbe of PILOs
a.1	Recognize Perfective tense, passive/active voice, conditional sentences, and reported speech	A1
a.2	Identify phrases, clauses, and sentence patterns and sentence types.	
a.3	Show familiarity with paragraph layout and paragraph structure, and also with the scientific/nonscientific language used in their fields	
b.1	Examine the accuracy of sentences with a special focus on perfective tense, passive/active voice, conditional forms, and reported speech	B3
b.2	Analyze phrases, clauses, and different patterns of sentences in English.	
c.1	Edit and produce accurate sentences in English with a special focus on perfective tense, passive/active voice, conditional forms, and reported speech.	C4
c.2	Produce different types of phrases, and clauses, and different patterns of sentences in English.	
d.1	Communicate satisfactorily in English orally and in writing.	D1
d.2	Use modern technology to improve your language and for research.	D3

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1- Recognize Perfective tense, passive/active voice, conditional sentences, and reported speech	1. Lectures 2. Class discussion	Quizzes Homework Mid-Exam Final Exam
a2- Identify phrases, clauses, and sentence patterns and sentence types.		
a3- Show familiarity with paragraph layout and paragraph structure, and also with the scientific/nonscientific language used in their fields		

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1- Examine the accuracy of sentences with a special focus on perfective tense, passive/active voice, conditional forms, and reported speech	Lectures Class discussions In-class exercises/worksheets	Quizzes Written exam
b2- nAnalyze phrases, clauses, and different patterns of sentences in English.		

(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1- Edit and produce accurate sentences in English with a special focus on perfective tense, passive/active voice, conditional forms, and reported speech.	Lectures Discussion In-class exercises/worksheets	Active class participation midterm, final exam .

c2- Produce different types of phrases, and clauses, and different patterns of sentences in English.		

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1- Communicate satisfactorily in English orally and in writing.	Classroom discussion Group work self-study	Presentation Reports
d2- Use modern technology to improve your language and for research.		

V. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	contact hours
1	Introduction + Revision	a1, a2,b1	- Introducing the course objectives - Revising topics taken in English (101)	1	2
2	Advanced grammar	a1, a2,a3,b1,b2,c1,c2	- Perfective tense (present & past)	1	2
3	Advanced grammar	a1, a2,a3,b1,b2,c1,c2,d1	- Passive / active voice	1	2
4	Advanced grammar	a1, a2,a3,b1,b2,c1,c2,d1	- Conditional sentences - Reported speech	1	2
5	Phrases vs clauses	a1, a2,a3,b1,b2,c1,c2,d1	- Show the difference between a phrase and a clause - Introduce different types of phrases in their simplest form: Noun phrases, Verb phrases, Adjective phrases, Adverb phrases, and Prepositional phrases	1	2
6	Phrases vs clauses	a1, a2,a3,b1,b2,c1,c2,d1	- Dependent clause vs independent clauses	1	2

			- Clauses and sentence patterns - Conjunctions		
7	Midterm Exam	a1, a2,a3,b1,b2,c1,c2,d1, d2		1	2
8	Sentence patterns	a1, a2,a3,b1,b2,c1,c2,d1	- Simple sentences -Compound sentences -Complex sentences -Affirmative sentences -interrogative sentences - imperative sentences	2	4
10	Introducing short paragraphs	a1, a2,a3,b1,b2,c1,c2,d1	- Lay out - Structure(topic sentence, main ideas, supporting details, and concluding sentence).	1	2
11	Exercises on paragraph structure	a1, a2,a3,b1,b2,c1,c2,d1	**Ask ss. to**: -identify paragraphs elements (topic sentence, main ideas, supporting details, and conclusion), -write missing paragraph elements, -correct paragraphs for their elements	1	2
12	Maintaining Paragraph content	a1, a2,a3,b1,b2,c1,c2,d1, d2	- Coherence - Cohesion - Unity	1	2
13	writing short paragraphs	a1, a2,a3,b1,b2,c1,c2,d1	- Ss. are asked to write short paragraphs - Ss. are asked to edit short paragraphs	1	2
	Final Exam	a1, a2,a3,b1,b2,c1,c2,d1, d2		1	2
Number of Weeks /and Units Per Semester				**15**	**30**

VI. Teaching strategies of the course:

1. Lectures
2. Class discussion
3- In-class exercises/worksheets
4- Group work
5- Self-study

VII. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Edit the following sentences with special focus on perfective tense, passive/active voice, conditional forms, and reported speech.	a1, a2,a3,b1,b2,c1,c2,d1	5	1
2	Identify phrases and clauses in the given sentences. Write phrases and clauses of your own	a1, a2,a3,b1,b2,c1,c2,d1	8	1
3	Identify the types of sentences. Write 5 sentences for every pattern.	a1, a2,a3,b1,b2,c1,c2,d1	10	2
4	Write a paragraph on a given topic considering content and structure.	a1, a2,a3,b1,b2,c1,c2,d1,d2	13	2

VIII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	**Assignments**	5, 8, 10, 13	6	6%	a1, a2,a3,b1,b2,c1,c2,d1,d2
2	Participation	All	2	2%	a1, a2,a3,b1,b2,c1,c2,d1,d2

3	Quizzes	6	2	2%	a1, a2,a3,b1,b2,c1,c2,d1,d2
4	Mid-term exam	7	20	20%	a1, a2,a3,b1,b2,c1,c2,d1,d2
5	Final Exam	16	70	70%	a1, a2,a3,b1,b2,c1,c2,d1,d2
6	total		100	100%	

IX. Learning Resources:

1- Required Textbook(s) .

- Langan, J.(2006), English Skills With Readings, 6th Edition, McGraw-Hill, Newyork.
Vince, M.(2008), Macmillan English Grammar in Context (Intermediate with key), Macmillan Publishers Limited, Oxford.

2- Essential References.

1-
2-

3- Electronic Materials and Web Sites *etc.*

1-
2-
3-

X. Course Policies:

1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
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	group work
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7	**Other policies:** -

Template for Course Plan (Syllabus) English Language2

I. – Information about Faculty Member Responsible for the Course:

Name of Faculty Member		Office Hours					
Location& Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Identification and General Information:

1.	Course Title:	English Language2				
2.	Course Number & Code:	ENG 102				
3.	Credit hours:	C.H				Total
		Th.	Seminar	Pr.	F. Tr.	
		2				2
4.	Study level/year at which this course is offered:	First Level, Second Semester				
5.	Pre –requisite (if any):	English Language1				
6.	Co –requisite (if any):					
7.	Program (s) in which the course is offered	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8.	Language of teaching the course:	English				
9.	System of Study:	Semester				
10.	Mode of delivery:	Regular				
11	Location of teaching the course:	University campus				

III. Course Description:

This course is a skill-based course that focuses on developing the general and academic language skills of the students. The course builds on what the students have achieved in ENG101. It continues to develop the students' language skills and competencies by exposing them to a variety of general and academic contexts at Preintermediate and Intermediate language levels. In addition, the course builds the students' ability in the language use area through equipping them with a wide range of vocabulary and grammatical structures like the perfective, passive/active voices, conditional sentences, and reported speech. After that the students will be introduced to sentence structure starting with the main differences between phrases, dependent and independent clauses, and sentence patterns and types as prerequisites to master short paragraph text comprehension and paragraph

writing. The focus will be on paragraph layout and paragraph basic elements like topic sentence, main ideas, supporting details, conclusion, cohesion, coherence, and unity. Moreover, the course develops the learners' cognitive skills such as analyzing, criticizing, synthesizing, and evaluating which are needed by the students at the university stage.

IV. Course Objectives:

By the end of the course students would be able to:
1- Develop general and academic language skills.
2- Equip with some advanced topics in grammar that will help them in developing their writing skill.
3- Prepare for paragraph writing through the study of phrases and clauses, and then through the teaching of different patterns of sentences.
4- Introduce paragraph layout and structure.

V. Intended learning outcomes (ILOs) of the course:

Brief summary of the knowledge or skill the course is intended to develop:

- Recognize Perfective tense, passive/active voice, conditional sentences, and reported speech
- Identify phrases, clauses, and sentence patterns and sentence types.
- Show familiarity with paragraph layout and paragraph structure, and also with the scientific/nonscientific language used in their fields
- Examine the accuracy of sentences with a special focus on perfective tense, passive/active voice conditional forms, and reported speech
- Analyze phrases, clauses, and different patterns of sentences in English.
- Edit and produce accurate sentences in English with a special focus on perfective tense, passive/active voice, conditional forms, and reported speech.
- Produce different types of phrases, and clauses, and different patterns of sentences in English.
- Communicate satisfactorily in English orally and in writing.
- Use modern technology to improve your language and for research.

VI. Course Content:

- Distribution of Semester Weekly Plan of Course Topics/Items and Activities.

A – Theoretical Aspect:

Order	Topics List	Week Due	Contact Hours
1	**Introduction + Revision:** - Introducing the course objectives - Revising topics taken in English (101)	1	2
2	**Advanced grammar:** Perfective tense (present & past)	2	2

3	**Advanced grammar:** Passive / active voice	3	2
4	**Advanced grammar:** Conditional sentences Reported speech	4	2
5	**Phrases vs clauses:** - Show the difference between a phrase and a clause - Introduce different types of phrases in their simplest form: Noun phrases, Verb phrases, Adjective phrases, Adverb phrases, and Prepositional phrases	5	2
6	**Phrases vs clauses:** - Dependent clause vs independent clauses - Clauses and sentence patterns - Conjunctions	6	2
7	**Midterm Exam**	7	2
8	**Sentence patterns:** - Simple sentences -Compound sentences -Complex sentences -Affirmative sentences -interrogative sentences - imperative sentences	8, 9	4
9	**Introducing short paragraphs**: -Lay out - Structure(topic sentence, main ideas, supporting details, and concluding sentence).	10	2
10	**Exercises on paragraph structure:** Ask ss. To: -identify paragraphs elements (topic sentence, main ideas, supporting details, and conclusion), -write missing paragraph elements, -correct paragraphs for their elements	11	2
11	**Maintaining Paragraph content:** - Coherence - Cohesion - Unity	12	2
12	**writing short paragraphs:** - Ss. Are asked to write short paragraphs - Ss. Are asked to edit short paragraphs	13	2
13	Final exam	14	2
Number of Weeks /and Units Per Semester		**14**	**28**

VII. Teaching strategies of the course:

1. Lectures
2. Class discussion
3- In-class exercises/worksheets
4- Group work
5- Self-study

VIII. Assignments:

No	Assignments	Week Due	Mark
1	Edit the following sentences with special focus on perfective tense, passive/active voice, conditional forms, and reported speech.	5	1
2	Identify phrases and clauses in the given sentences. Write phrases and clauses of your own	8	1
3	Identify the types of sentences. Write 5 sentences for every pattern.	10	2
4	Write a paragraph on a given topic considering content and structure.	13	2

IX. Schedule of Assessment Tasks for Students During the Semester:

Assessment	Type of Assessment Tasks	Week Due	Mark	Proportion of Final Assessment
1	**Assignments**	5, 8, 10, 13	6	6%
2	Participation	All	2	2%
3	Quizzes	6	2	2%
4	Mid-term exam	7	20	20%
5	Final Exam	16	70	70%
6	Total		100	100%

X. Learning Resources:

1- Required Textbook(s).

Clarke, S.(2008), Macmillan English Grammar in Context (Essential with key), Macmillan Publishers Limited, Oxford.

Chakravarty, A., & Boehme, B.(eds), (2004), Gramar & Usage For Better Writing, Amsco Sc Publications, New York
2- Essential References.
3- Electronic Materials and Web Sites *etc*.

XI. Course Policies:	
1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam.
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** - Assignments and projects will be assessed individually unless the teacher request for group work.
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course.
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:**

Course Specification of Islamic culture

I. المعلومات العامة عن المقرر:						
1	اسم المقرر:	Islamic Culture				
2	رمز المقرر ورقمه:	ISL101				
3	الساعات المعتمدة:	محاضرة	سمنار	عملي	تدريب	الإجمالي
		2	-	-	-	2
	المستوى والفصل الدراسي:	الاول - الفصل الدراسي الثاني				
4	المتطلبات السابقة لدراسة المقرر(إن وجدت):	لا يوجد				
5	المتطلبات المصاحبة لدراسة المقرر(إن وجدت):	لا يوجد				
6	البرنامج/التي يتم فيها تدريس المقرر:	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
7	لغة تدريس المقرر:	العربية				
8	نظام الدراسة:	فصلي				
9	أسلوب الدراسة في البرنامج:	انتظام				
10	مكان تدريس المقرر:	جامعة السعيد				
11	اسم معد مواصفات المقرر:	د / علي عبدالله حميد، د/عبدالكريم شرف، د/عبدالباسط عبده ردمان				

II. وصف المقرر:

يهدف هذا المقرر إلى غرس المفاهيم الإسلامية الصحيحة لدى الطلاب الدارسين في الجامعة، وتعديل المسار الفكري والثقافي والسلوكي لديهم، واكسابهم المناعة ضد التيارات المعادية للثقافة الإسلامية، ويعالج هذا المقرر ما يستجد على الساحة الإسلامية من قضايا فكرية وفقهية معاصرة، ويسهم في إثراء الجوانب المعرفية والفكرية، والثقافية، والتربوية والقيمية في حياة المجتمع، للحفاظ على استقامة مسيرته ومثالية شخصيته.

III. مخرجات تعلم المقرر:

1. بيان المقصود بالثقافة الاسلامية واهميتها للدارسين.
2. المقارنة بين الثقافة الاسلامية والثقافات الأخرى، وبيان تميز الأمة الإسلامية بثقافة عريقة تميزها بين الثقافات البشرية في مقوماتها وعناصرها وخصائصها.
3. تحديد عناصر الثقافة الاسلامية وتوضيح مكوناتها.
4. تطبيق مبادى الثقافة الاسلامية كسلوك حضاري لدى الدارسين.
5. تطبيق مهارات الحوار والنقاش والتواصل والتفاعل مع الاخرين.
6- التواصل الفعال والعمل ضمن فريق عمل.

IV. مخرجات التعلم:		
A المعرفة والفهم		
موائمة مخرجات تعلم المقرر مع مخرجات تعلم البرنامج		
مخرجات تعلم البرنامج (المعرفة والفهم)		
بعد الانتهاء من البرنامج، سيكون الخريجون قادرين على:		
A1	الإحاطة بمفهوم الثقافة الإسلامية وأهميتها ومصادرها وخصائصها .	a.1
	تبيان أن الإسلام عقيدة وشريعة ومنهاج حياة	a.2
	فهم العلاقة بين الثقافة الإسلامية والثقافات الأخرى في الماضي والحاضر.	a.3
B المهارات الذهنية		
موائمة مخرجات تعلم المقرر مع مخرجات تعلم البرنامج		
مخرجات تعلم البرنامج (المهارات الذهنية)		
بعد الانتهاء من البرنامج، سيكون الخريجون قادرين على:		
	تفسير الظواهر الثقافية والفكرية والاجتماعية المنتشرة في البيئة الإسلامية.	b.1
C المهارات المهنية والعملية		
موائمة مخرجات تعلم المقرر مع مخرجات تعلم البرنامج		
مخرجات تعلم البرنامج (المهارات المهنية والعملية)		
بعد الانتهاء من البرنامج، سيكون الخريجون قادرين على:		
C4	التعامل مع كافة البيانات والوثائق المتعلقة بموضوعات الثقافة الإسلامية.	c.1
C5	ترجمة مصادر ومراجع الثقافات الأخرى من اللغات الأجنبية	c.2
(D) المهارات العامة		
موائمة مخرجات تعلم المقرر مع مخرجات تعلم البرنامج		
مخرجات تعلم البرنامج (المهارات العامة)		
بعد الانتهاء من البرنامج، سيكون الخريجون قادرين على:		
D1	العمل ضمن فريق عمل وتشكيل مجموعات وتوزيع المهام وحل المشكلات وإنجاز الأبحاث	d.1
	ممارسة مهارات التواصل مع الآخرين والتعبير عن الآراء والأفكار المختلفة أمام الزملاء	d.2

II. مواءمة مخرجات التعلم باستراتيجيات التدريس والتقويم

أولا: مواءمة مخرجات تعلم المقرر (المعارف والفهم) باستراتيجية التدريس والتقويم:

مخرجات المقرر / المعرفة والفهم	استراتيجية التدريس	استراتيجية التقويم
a1-الإحاطة بمفهوم الثقافة الإسلامية وأهميتها ومصادرها وخصائصها.	المحاضرة والإلقاء	الأسئلة التقويمية الشفهية
a2-تبيان أن الإسلام عقيدة وشريعة ومنهاج حياة	المحاضرة والإلقاء	المناقشات الصفية
a3-فهم العلاقة بين الثقافة الإسلامية والثقافات الأخرى في الماضي والحاضر.	التعلم التعاوني	التقارير

ثانيا: مواءمة مخرجات تعلم المقرر (المهارات الذهنية) باستراتيجية التدريس والتقويم:

مخرجات المقرر/ المهارات الذهنية	استراتيجية التدريس	استراتيجية التقويم
b1- تفسير الظواهر الثقافية والفكرية والاجتماعية المنتشرة في البيئة الإسلامية.	الحوار والمناقشة	الواجبات والتكاليف

ثالثا: مواءمة مخرجات تعلم المقرر (المهارات المهنية والعملية) باستراتيجية التدريس والتقويم:

مخرجات المقرر/ المهارات المهنية والعملية	استراتيجية التدريس	استراتيجية التقويم
c1 التعامل مع كافة البيانات والوثائق المتعلقة بموضوعات الثقافة الإسلامية.	الخرائط الذهنية	الواجبات والتكاليف
c2 ترجمة مصادر ومراجع الثقافات الأخرى من اللغات الأجنبية	حلقات العصف الذهني	تقويم أداء الطلاب إثناء حلقات العصف الذهني

رابعا: مواءمة مخرجات تعلم المقرر (المهارات العامة) باستراتيجية التدريس والتقويم:

مخرجات المقرر	استراتيجية التدريس	استراتيجية التقويم
d1 العمل ضمن فريق عمل وتشكيل مجموعات وتوزيع المهام وحل المشكلات وإنجاز الأبحاث	الحوار والمناقشة	الواجبات والتكاليف
d2 مارسة مهارات التواصل مع الآخرين والتعبير عن الآراء والأفكار المختلفة أمام الزملاء	حلقات العصف الذهني	الواجبات والتكاليف

تحديد وكتابة مواضيع المقرر الرئيسة والفرعية (النظرية والعملية) وربطها بمخرجات التعلم المقصودة للمقرر مع تحديد الساعات المعتمدة لها.

مواضيع محتوى المقرر					
الرقم	وحدات/ موضوعات المقرر	المواضيع التفصيلية	عدد الأسابيع	الساعات الفعلية	مخرجات تعلم المقرر
1	مقدمة في الثقافة الإسلامية	تعريفها، أهميتها، مصادرها، خصائصها تعريفات (العلم ، المعرفة، الحضارة، المدنية، الدين، التربية، الدين، الفكر، النظم)	1	2	a1,a2,a3
2	الإسلام عقيدة وشريعة	تحديد عقيدة الانسان، أركان الإيمان - نواقض الايمان – شريعة الاسلام – الاسس التي بنيت عليها الشريعة مفهوم العبادة	1	2	a1,a2,a3,b1,b2
3	آداب طالب العلم	مكانة العلم والعلماء ، أداب الطالب مع نفسه ، مع أستاذه ، أثناء المحاضرة ، في سنوات دراسته، مع المجتمع	1	2	a1,a2,a3,b1,b2,c1,d1
4	نظام الأسرة في الإسلام	المقاصد الشرعية للنظام الأسري الأسرة (أهميتها، وظائفها، مقوماتها، خصائصها، المشكلات التي تواجهها) مكانة المرأة في الإسلام شبهات وردود	1	2	a1,a2,a3,b1,b2
5	حقوق الإنسان	مقارنة بين حقوق الإنسان في الإسلام وحقوق الإنسان في المواثيق الدولية حقوق الإنسان في السلم والحرب	1	2	a1,a2,a3,b1,b2,c1,d1,d2
6	اختبار نصفي		1	2	a1,a2,a3,b1,b2,c1,d1,d2
7	قضايا طبية معاصرة	واجبات الطبيب ، أخلاقياته ، الضوابط الشرعية لممارسة الطب، دراسة بعض القضايا الطبية مثل: (التشريح، زراعة الاعضاء)	1	2	a1,a2,a3,b1,b2,c1,d1,d2
8	الإعلام الإسلامي	مفهومه، خصائصه، أسسه، منطلقاته، ضوابطه، الدور الاعلامي المنشود	1	2	a1,a2,a3,b1,b2,c1,d1,d2
9	التحديات الداخلية التي تواجه الثقافة	العصبية، العنصرية، الطائفية الغلو والتطرف،	1	2	a1,a2,a3,b1,b2,c1,d1,d2

	الإسلامية	واثر ذلك على المجتمع			
10	**التحديات الخارجية التي تواجه الثقافة الإسلامية**	الغزو الفكري والعسكري الاستشراق والتنصير العلمانية والعولمة	2	4	a1,a2,a3,b1,b2,c1,d1,d2
11	**قضايا إسلامية معاصرة**	قضية فلسطين الأقليات الإسلامية الإسلام والآخر الفنون والترفيه في الإسلام	2	4	a1,a2,a3,b1,b2,c1,d1,d2
12	**ملامح النظام الاقتصادي في الاسلامي**	مفهومه، أركانه، خصائصه، ضوابطه، دراسة بعض المعاملات الاقتصادية مثل: (الربا، المرابحة، التامين)	1	2	a1,a2,a3,b1,b2,c1,d1,d2
	إجمالي الأسابيع والساعات			**28**	

IV. استراتيجية التدريس:

المحاضرة والإلقاء
التعلم التعاوني
مجموعات العمل الصغيرة
الخرائط الذهنية
الحوار والمناقشة
حلقات العصف الذهني

V. التعيينات والتكليفات:

الرقم	التكليف/النشاط	مخرجات التعلم	الأسبوع	الدرجة
1	تكليف الطلاب بقراءة كتب ومراجع مساندة	a1,a2,a3,b1,b2,c1,d1,d2	**1**	**0**
2	عمل صفحة للمقرر بالواتس لإثراء موضوعات المقرر	a1,a2,a3,b1,b2,c1,d1,d2	**1**	**0**
3	إعداد أوراق ومشاريع بحثية	a1,a2,a3,b1,b2,c1,d1,d2	**3**	**5**
4	تكليف الطلاب بعرض بعض موضوعات الثقافة الإسلامية بواسطة ال Power Point	a1,a2,a3,b1,b2,c1,d1,d2	**12 - 4**	**5**

VI. تقويم التعلم:

الرقم	أنشطة التقويم	الأسبوع	الدرجة	نسبة الدرجة إلى درجة	المخرجات التي يحققها

				التقويم النهائي	
1	تكليف الطلاب بقراءة كتب ومراجع مساندة	1	0	%0	a1,a2,a3,b1,b2,c1,d1,d2
2	عمل صفحة للمقرر بالواتس لإثراء موضوعات المقرر	1	0	%0	a1,a2,a3,b1,b2,c1,d1,d2
3	إعداد أوراق ومشاريع بحثية	3	5	%5	a1,a2,a3,b1,b2,c1,d1,d2
4	تكليف الطلاب بعرض بعض موضوعات الثقافة الإسلامية بواسطة ال Power Point	4-12	5	%5	a1,a2,a3,b1,b2,c1,d1,d2
5	**اختبار منتصف الفصل**	6	20	% 20	a1,a2,a3,b1,b2,c1,d1,d2
6	**الاختبار النهائي**	15 – 16	70	%70	a1,a2,a3,b1,b2,c1,d1,d2

VII. مصادر التعلم:

المراجع الرئيسة: (لا تزيد عن مرجعين)

3. فؤاد البنا: الثقافة الإسلامية، مركز الكتاب الجامعي، جامعة العلوم والتكنولوجيا
4. علي عبدالله حميد، الثقافة الاسلامية، جامعة تعز

المراجع المساعدة

4. عبد الملك عوده وآخرون: الثقافة الإسلامية، منشورات جامعة صنعاء، ط4، 1990م.
5. أحمد بن الخطيب وآخرون: بحوث في الثقافة الإسلامية، ،دار الحكمة ،الدوحه ،ط1، 1414هـ.
6. مجموعة من المختصين في الثقافة الإسلامية:: الثقافة الإسلامية تخصصا ومادة وقسما علميا ،جامعة الإمام بن سعود الإسلامية ،مطابع الجامعة،ط1، 1417هـ.

مواد إلكترونية وإنترنت: (إن وجدت)

1- أفضل كتب الثقافة الإسلامية
https://download-islamic-religion-pdf-ebooks.com/157-1-best-books
2

Course Policies:

1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.

3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects**: - Assignments and projects will be assessed individually unless the teacher request for group work
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the faculty rules.
7	**Other policies**: -

خطة المقرر الدراسي: الثقافة الاسلامية

I. معلومات عن مدرس المقرر:							
الاسم		الساعات المكتبية (/ أسبوعيا)					
المكان ورقم الهاتف		السبت	الأحد	الاثنين	الثلاثاء	الأربعاء	الخميس
البريد الإلكتروني							

II. المعلومات العامة عن المقرر:						
1	اسم المقرر:	Islamic Culture				
2	رمز المقرر ورقمه:	ISL 101				
3	الساعات المعتمدة:	محاضرة	سمنار	عملي	تدريب	الإجمالي
		2	-	-	-	2
	المستوى والفصل الدراسي:	الاول - الفصل الدراسي الثاني				
4	المتطلبات السابقة لدراسة المقرر(إن وجدت):	لا يوجد				
5	المتطلبات المصاحبة لدراسة المقرر(إن وجدت):	لا يوجد				
6	البرنامج/التي يتم فيها تدريس المقرر:	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
7	لغة تدريس المقرر:	العربية				
8	نظام الدراسة:	فصلي				
9	أسلوب الدراسة في البرنامج:	انتظام				
10	مكان تدريس المقرر:	جامعة السعيد				
11	اسم معد مواصفات المقرر:	د / علي عبدالله حميد، د/عبدالكريم شرف، د/عبدالباسط عبده ردمان				
12	تاريخ اعتماد مجلس الجامعة:					

XIV. وصف المقرر الدراسي:

يهدف هذا المقرر إلى غرس المفاهيم الإسلامية الصحيحة لدى الطلاب الدارسين في الجامعة، وتعديل المسار الفكري والثقافي والسلوكي لديهم، واكسابهم المناعة ضد التيارات المعادية للثقافة الإسلامية، ويعالج هذا المقرر ما يستجد على الساحة الإسلامية من قضايا فكرية وفقهية معاصرة، ويسهم في إثراء الجوانب المعرفية والفكرية، والثقافية، والتربوية والقيمية في حياة المجتمع، للحفاظ على استقامة مسيرته ومثالية شخصيته.

XV. مخرجات التعلم المقصودة للمقرر:
الإحاطة بمفهوم الثقافة الإسلامية وأهميتها ومصادرها وخصائصها .
تبيان أن الإسلام عقيدة وشريعة ومنهاج حياة
فهم العلاقة بين الثقافة الإسلامية والثقافات الأخرى في الماضي والحاضر.
تفسير الظواهر الثقافية والفكرية والاجتماعية المنتشرة في البيئة الإسلامية.
التعامل مع كافة البيانات والوثائق المتعلقة بموضوعات الثقافة الإسلامية.
ترجمة مصادر ومراجع الثقافات الأخرى من اللغات الأجنبية
العمل ضمن فريق عمل وتشكيل مجموعات وتوزيع المهام وحل المشكلات وإنجاز الأبحاث
ممارسة مهارات التواصل مع الآخرين والتعبير عن الآراء والأفكار المختلفة أمام الزملاء

XVI. محتوى المقرر:				
الجانب النظري:				
الرقم	وحدات المقرر	المواضيع التفصيلية	**الأسبوع**	**الساعات الفعلية**
1	**مقدمة في الثقافة الإسلامية**	تعريفها، أهميتها، مصادرها، خصائصها تعريفات (العلم ، المعرفة، الحضارة، المدنية، الدين، التربية، الدين، الفكر، النظم)	**1**	**2**
2	**الإسلام عقيدة وشريعة**	تحديد عقيدة الانسان، أركان الإيمان - نواقض الايمان – شريعة الاسلام – الاسس التي بنيت عليها الشريعة مفهوم العبادة	**1**	**2**
3	**آداب طالب العلم**	مكانة العلم والعلماء ، أداب الطالب مع نفسه ، مع أستاذه ، أثناء المحاضرة ، في سنوات دراسته، مع المجتمع	**1**	**2**
4	**نظام الأسرة في الإسلام**	المقاصد الشرعية للنظام الأسري الأسرة (أهميتها، وظائفها، مقوماتها، خصائصها، المشكلات التي تواجهها) مكانة المرأة في الإسلام شبهات وردود	**1**	**2**
5	**حقوق الإنسان**	مقارنة بين حقوق الإنسان في الإسلام وحقوق الإنسان في	**1**	**2**

		المواثيق الدولية حقوق الإنسان في السلم والحرب		
6	**اختبار نصفي**	اختبار نصفي	1	2
7	**قضايا طبية معاصرة**	واجبات الطبيب ، أخلاقياته ، الضوابط الشرعية لممارسة الطب، التشريح، زراعة الاعضاء	1	2
8	**الإعلام الإسلامي**	مفهومه وخصائصه وأسسه ومنطلقاته وضوابطه والدور الاعلامي المنشود	1	2
9	**التحديات الداخلية التي تواجه الثقافة الإسلامية**	العصبية والعنصرية والطائفية الغلو والتطرف واثرها في المجتمع	1	2
10	**التحديات الخارجية التي تواجه الثقافة الإسلامية**	الغزو الفكري والعسكري الاستشراق والتنصير العلمانية والعولمة	2	4
11	**قضايا إسلامية معاصرة**	قضية فلسطين الأقليات الإسلامية الإسلام والآخر الفنون والترفيه في الإسلام	2	4
12	**ملامح النظام الاقتصادي في الاسلامي**	مفهومه، أركانه، خصائصه، ضوابطه، أمثلة لمعاملات مالية (الربا، المرابحة، التامين)	1	2
عدد الأسابيع والساعات			**14**	**28**

XVI. استراتيجية التدريس
المحاضرة
الالقاء –المناقشة
الحوار والمناقشة: طرح أسئلة للموضوعات على الطلاب بهدف تنمية قدراتهم على الحوار والمناقشة
المناقشة الجماعية
التعليم التعاوني
العصف الذهني
مجموعات العمل
الخرائط الذهنية

XVII. التكليفات / المهام:			
الرقم	التكليف/النشاط	الأسبوع	الدرجة (إن وجدت)
1	تكليف الطلاب بقراءة كتب ومراجع مساندة	1	**0**
2	عمل صفحة للمقرر بالواتس لإثراء موضوعات المقرر	1	**0**
3	إعداد أوراق ومشاريع بحثية	3	**5**
4	تكليف الطلاب بعرض بعض موضوعات الثقافة الإسلامية بواسطة ال Power Point	12-4	**5**

XIX. تقويم التعلم:				
الرقم	موضوعات التقويم	موعد التقويم/ اليوم والتاريخ	الدرجة	الوزن النسبي *(نسبة الدرجة إلى درجة التقويم النهائي)*
.5	تكليف الطلاب بقراءة كتب ومراجع مساندة	1	0	%0
.6	عمل صفحة للمقرر بالوتس لإثراء	1	0	% 0
-3	إعداد أوراق ومشاريع بحثية	3	5	%5
	تكليف الطلاب بعرض بعض موضوعات الثقافة الإسلامية بواسطة ال Power Point	12-4	5	%5
	اختبار منتصف الفصل	6	20	%20
	الاختبار النهائي	16 – 15	70	%70
	المجموع		**100**	**100%**

XX. مصادر التعلم:

4. المراجع الرئيسة:

- فؤاد البنا: الثقافة الإسلامية، مركز الكتاب الجامعي، جامعة العلوم والتكنولوجيا
- علي عبدالله حميد، الثقافة الاسلامية، جامعة تعز.

5. المراجع المساعدة:

1.عبد الوهاب الديلمي وآخرون: الثقافة الإسلامية، جامعة صنعاء، ط4، 1990م.
2.أحمد بن الخطيب وآخرون: بحوث في الثقافة الإسلامية، دار الحكمة، الدوحة، ط1، 1414هـ.
3.مجموعة من المختصين في الثقافة الإسلامية: الثقافة الإسلامية تخصصا ومادة وقسما علميا، جامعة الإمام محمد بن سعود الإسلامية، مطابع الجامعة، ط1، 1417هـ.

1. مواد إلكترونية وإنترنت: *(إن وجدت)*
2. أفضل كتب الثقافة الإسلامية
3. https://download-islamic-religion-pdf-ebooks.com/157-1-best-books

X.Course Policies:	
1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects**: - Assignments and projects will be assessed individually unless the teacher request for group work
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the faculty rules.
7	**Other policies**: -

Course Specification of Anatomy and Histology

1. Course Identification and General Information:

1	**Course Title:**	**Anatomy and Histology**				
2	**Course Code & Number:**	**PHA122**				
3	**Credit hours:**	C.H				TOTAL
		Th.	Seminar	Pr	Tr.	
		Theory 2	Seminars, exercises..	Practical 1	Field, training	**3 Hs**
4	**Study level/ semester at which this course is offered:**	First Year/ 2nd semester				
5	**Pre –requisite (if any):**	General Biology				
6	**Co –requisite (if any):**					
8	**Program (s) in which the course is offered:**	Bachelor of Pharmaceutical Sciences				
9	**Language of teaching the course:**	English				
10	**Location of teaching the course:**	Faculty of medical and health sciences, Al-Saeed University				
11	**Prepared By:**	Waheed Abdulbari Alsowaidy				

2. Course Description:

Anatomy and Histology are two essential basic medical courses. Histology is the science that studies normal microscopic structures, ultra-structures and their related function; whereas, Anatomy studies the gross appearance of the various organs that make up the systems of the human body. Through class lecture, the students will be made to master the basic knowledge of the morphology and relations of the anatomical structures that are present in humans and the histological tissues that form these structures. The relation between the type of tissue present in an organ and the shape and functions of that organ is stressed.

3. Course Objectives:

- To define the various terms that are used in anatomy.
- To list and understand the different types of basic body tissues.
- To describe the components of each of the major body systems with regard to the organs that make up the system, the relations between the organs and the histological tissues that are present in each of these organs.

4. Course Intended learning outcomes (CILOs) of the course		WRITE Symbol and number of PILOs
a.1	Define the parts of the various systems of the body.	A1
a.2	Recognize the relations and the microscopic structure of the parts of the systems to each other	A1
a.3	Describe each part of the various systems; site, relations, blood supply etc, and the different in tissues and cellular components of each body part.	A3
b.1	Compare different body systems grossly and microscopically	B3
b.2	Find the relation of the anatomical and the histological composition of some systems and organs to their functions	B1
c.1	Apply the anatomical data to know site of various structures on student's own body. Then draw the histological picture of these structures.	C4
c.2	Use the anatomical data to localize various structures in order to examine them during clinical practice	C2
c.3	Classify the types and shape of cells of the different types of body tissues	C4
d.1	Deal with internet in research and communications and assignments	D2
d.2	Communicate by verbal and written means	D1

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:		
Knowledge and Understanding	Teaching strategies	Assessment Strategies
a.1 Define the parts of the various systems of the body.	Lectures, practical sittings	Written examination.
a.2 Recognize the relations and the microscopic structure of the parts of the systems to each other	Lecture , videos, modules	Written and practical examination, exercise.
a.3 Describe each part of the various systems; site, relations, blood supply etc, and the different in tissues and cellular components of each body part.	Lecture , Tutorials, vedeos	Written and practical examination, Problem – solving exercise.

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Intellectual Skills	Teaching strategies	Assessment Strategies
b1- Compare different body systems grossly and	Lecture, Problem-solving exercises	Written examination, Quizzes.
b2- Find the relation of the anatomical and the histological composition of some systems and organs to their functions	Lecture, Problem-solving exercises	Written examination, Quizzes.

© Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1- Apply the anatomical data to know site of various structures on student's own body. Then draw the histological picture of these structures.	Practical sittings, Videos , modules, seminars	Practical examination, seminar discussion,
C2- Use the anatomical data to localize various structures in order to examine them during clinical practice	Practical sittings, Videos , modules, homework	Practical examination, seminar discussion, homework assessments
C3- Classify the types and shape of cells of the different types of body tissues	Practical sittings, Videos , modules, homework	Practical examination, seminar discussion, homework assessments

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1- Deal with internet in research and communications and assignments	Tutorials, field visits	Field visits and tutorial discussion
d2- Communicate by verbal and written means	Tutorials, field visits	Field visits and tutorial discussion

5. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Learning Outcomes	Number of Weeks	contact hours
1	**Introduction** 1. Define anatomy and its different branches. 2. Understand the various levels of structural organization. 3. Understand the meaning of the Standard Anatomical Position and its significance. 4. Learn about the various planes used in the study of anatomy. 5. Define the various terms used in anatomy.	a.1, a.2	1	2
2	**Tissues** 1.Describe the general features & characteristics of epithelium. 2. Understand the basic structure & functions of Basal Lamina and how it differs from Basement Membrane. 3. Enumerate the types of epithelium and the bases of their classification 4. Define epithelial cell polarity. 5. List and differentiate between the types of cellular junctions. 6. Define connective tissue. 7. Enumerate the various types of cells that are present in this tissue and know their main histological features and functions. 8. Differentiate between the various types of connective tissue. 9. Learn about the main features of adipose tissue. 10. Enumerate the different types of cartilage, its main features and location.	a.1, a.2, a.3, b.1, b.2	1	2
3	**The skin** 1. Define the skin. 2. Know the various layers of the skin and the features of these layers. 3. Describe the appendages of the skin.	a.1, a.2, a.3, b.1, b.2	1	2
4	**Skeletal System** 1. Identify the main features of the osseous tissue. 2. Understand the characteristics of the bones that make up the axial skeleton. 3. Understand the characteristics of the bones that make up the appendicular skeleton.	a.1, a.2, a.3, b.1, b.2	1	2

	4. Define joints and know the differences between its various types. 5. Define the terms that are used in describing movements in the joints. 6. Discuss the important features of some of the large joints in the body.			
5	**Muscular system** 1. Identify the main features of muscular tissue and differentiate between the three types of muscles. 2. Take a quick overview of the several muscles present in the regions of the head, neck, thorax, abdomen and the upper and lower limbs.	a.1, a.2, a.3, b.1, b.2	1	2
6	**Nervous System** 1. Understand the main features of the nervous tissue. 2. Discuss briefly the characteristics of the structures that make up the central nervous system (brain and spinal cord). 3. Discuss briefly the parts of the peripheral nervous system (the cranial nerves, the spinal nerves and the autonomic nervous system). 4. Know the main differences between the general and special senses. 5. Know the main features of the olfactory epithelium. 6. Know the main features of taste buds. 7. Study the structure of the eye and related structures. 8. Study the structure of the ear.	a.1, a.2, a.3, b.1, b.2	1	2
7	**Cardiovascular System** 1. Define Blood and know its various components. 2. Study the main features of the cellular elements that are present in the blood. 3. Define the thoracic cavity and mediastinum. 4. Identify the main features of the heart. 5. Discuss the conducting pathway and the blood supply of the heart. 6. Define the pulmonary and systemic circulation. 7. Take a quick overview of the blood vessels present in the regions of the body.	a.1, a.2, a.3, b.1, b.2	1	3
8	**Midterm Exam**	a.1, a.2, a.3, b.1, b.2,d.1,d.2	1	2
9	**Respiratory System** 1. Identify the organs of the respiratory system. 2. Classify these organs structurally	a.1, a.2, a.3, b.1, b.2	1	2

	and functionally. 3. Discuss the main features of the organs.			
10	**Lymphatic System** 1. Identify the components of the lymphatic system. 2. Discuss the lymphatic vessels and organs of the lymphatic system (thymus, lymph nodes and spleen).	a.1, a.2, a.3, b.1, b.2	1	2
11	**Digestive System** 1. Enumerate the organs of the digestive system. 2. Study the main features of these various organs. 3. Study the main features of the accessory digestive organs and their involvement in the function of the digestive system.	a.1, a.2, a.3, b.1, b.2,d.1,d.2	1	2
12	**Urinary System** 1. List the organs of the renal system. 2. Know the main features and functions of these organs.	a.1, a.2, a.3, b.1, b.2	1	2
13	**Endocrine System** 1. Identify the various endocrine glands of the body. 2. Know their main anatomical and histological features.	a.1, a.2, a.3, b.1, b.2	1	2
14	**Reproductive System** 1. Know the differences between the male and female reproductive organs. 2. Identify the features of these organs.	a.1, a.2, a.3, b.1, b.2	1	2
15	Revision	a.1, a.2, a.3, b.1, b.2, c.1, c.2, c.3,d.1,d.2	1	2
16	Final exam	a.1, a.2, a.3, b.1, b.2,d.1,d.2	1	2
Number of Weeks /and Units Per Semester			**16**	**32**

B - Practical Aspect: (if any)

Order	Tasks/ Experiments	Number of Weeks	contact hours	Learning Outcomes
1	1- Understand the meaning of the Standard Anatomical Position and its significance. 2- Learn about the various planes used in the study of anatomy.	1	**2**	a.1, a.2, a3, c1

2	List and differentiate between the types of tissues	1		a.1, a.2, a3, c1, c.2, c.3
3	1. Describe the appendages of the skin. 2.Understand the characteristics of the bones that make up the axial skeleton. 3.Understand the characteristics of the bones that make up the appendicular skeleton.	**1**	**2**	a.1, a.2, a3, c1, c.2, c.3
4	Identify the main features of muscular tissue and differentiate between the three types of muscles.	**1**	2	a.1, a.2, a3, c1, c.2, c.3
5	Discuss briefly the characteristics of the structures that make up the central nervous system (brain and spinal cord).	**1**	2	a.1, a.2, a3, c1, c.2, c.3
6	1- Define Blood and know its various components. 2. Study the main features of the cellular elements that are present in the blood. 3. Define the thoracic cavity and mediastinum	**1**	2	a.1, a.2, a3, c1, c.2, c.3
7	**Midterm Exam**	**1**	2	a.1, a.2, a3, c1, c.2, c.3
8	1- Identify the organs of the respiratory system. 2- Identify the components of the lymphatic system.	**1**	2	a.1, a.2, a3, c1, c.2, c.3
9	1. Study the main features of these various organs. 2. Study the main features of the accessory digestive organs and their involvement in the function of the digestive system.	**1**	2	a.1, a.2, a3, c1, c.2, c.3
10	Identify the main features and functions of the urinary and the sexual organs.	**1**	2	a.1, a.2, a3, c1, c.2, c.3
11	Identify the various endocrine glands of the body.	**1**	2	a.1, a.2, a3, c1, c.2, c.3
12	**Final exam**	**1**	2	a.1, a.2, a3, b,1, b.2, b3, c1, c.2, c.3
Number of Weeks /and Units Per Semester			24	

6. Teaching strategies of the course:

Lecture, Problem- solving exercises
Practical sittings, Videos , modules, seminars, homework
Tutorials, field visits

7. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Homework	a.1, a.2, a.3, b.1, b.2, b3, d.1, d.2	8th	5
2	Field visit report assessment	a.1, a.2, a.3, b.1, b.2,	10th	5
3	Midterm practical Exam	a.1, a.2, a.3, b.1, b.2, c1, c.2, c.3	7th	10
4	Midterm theoretical Exam	a.1, a.2, a.3, b.1, b.2,	8th	10
5	Final Practical Exam	a.1, a.2, a.3, b.1, b.2, c1, c.2, c.3, d.1, d.2	12th	30
6	Final theoretical Exam	a.1, a.2, a.3, b.1, b.2, c1, d.1, d.2	16th	40

8. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Homework	8th	5	5%	a.1, a.2, a.3, b.1, b.2, b3, d.1, d.2
2	Field visit report assessment	10th	5	5%	a.1, a.2, a.3, b.1, b.2,
3	Midterm practical Exam	7th	10	10%	a.1, a.2, a.3, b.1, b.2, c1, c.2, c.3
4	Midterm theoretical Exam	8th	10	10%	a.1, a.2, a.3, b.1, b.2,
5	Final Practical Exam	12th	30	30%	a.1, a.2, a.3, b.1, b.2, c1, c.2, c.3, d.1, d.2
6	Final theoretical Exam	16th	40	40%	a.1, a.2, a.3, b.1, b.2, c1, d.1, d.2

9. Learning Resources:

- *Written in the following order: (Author - Year of publication – Title – Edition – Place of publication – Publisher).*

1- Required Textbook(s) (maximum two).

1- Principals of Anatomy and Physiology; Gerard J. Tortora. (The recommended textbook).
2- Clinical Anatomy by System; Richard S. Snell.

2- Essential References.

1-Basic Histology Text &Atlas; L C Junqueria & J Carneiro.
4- Di Fiore's Atlas of Histology with Clinical Correlation.

3- Electronic Materials and Web Sites *etc*.

1-
2-
3-

10. Course Policies:

1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2	**Tardy:** - Any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - Any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects**: - Assignments and projects will be assessed individually unless the teacher request for group work
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course

6	**Plagiarism:** - Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:** -

Template for Course Plan (Syllabus) of Anatomy and Histology

I. - Information about Faculty Member Responsible for the Course:

		Office Hours					
Name of Faculty Member	Waheed Abdulbari Alsowaidy						
Location& Telephone No.	Taiz; Yemen Republic 773425333	SAT	SUN	MON	TUE	WED	THU
E-mail	Waheed22sr@gmail.com	6		6		6	

II. Course Identification and General Information:

1.	Course Title:	Anatomy and Histology				
2.	Course Number & Code:	PHA122				
3.	Credit hours:	C.H				Total
		Th.	Seminar	Pr.	F. Tr.	
		Theory 2	Seminars, exercises..	Practical 1	Field, training	3
4.	Study level/year at which this course is offered:	First Year/ 2nd semester				
5.	Pre –requisite (if any):	General Biology				
6.	Co –requisite (if any):					
7.	Program (s) in which the course is offered	Bachelor of Pharmaceutical Sciences				
8.	Language of teaching the course:	English				
9.	System of Study:	Regular				
10.	Mode of delivery:					
11.	Location of teaching the course:	Faculty of medical and health sciences, Al-Saeed University				

III. Course Description:

Anatomy and Histology are two essential basic medical courses. Histology is the science that studies normal microscopic structures, ultra-structures and their related function; whereas, Anatomy studies the gross appearance of the various organs that make up the systems of the human body. Through class lecture, the students will be made to master the basic knowledge of the morphology and relations of the anatomical structures that are present in humans and the histological tissues that form these structures. The relation between the type of tissue present in an organ and the shape and functions of that organ is stressed.

IV. Intended learning outcomes (ILOs) of the course:

- Brief summary of the knowledge or skill the course is intended to develop:

- To define the various terms that are used in anatomy.
- To list and understand the different types of basic body tissues.
- To describe the components of each of the major body systems with regard to the organs that make up the system, the relations between the organs and the histological tissues that are present in each of these organs.

V. Course Content:

- Distribution of Semester Weekly Plan of Course Topics/Items and Activities.

A – Theoretical Aspect:

Order	Topics List	Week Due	Contact Hours
1	**Introduction** 1. Define anatomy and its different branches. 2. Understand the various levels of structural organization. 3. Understand the meaning of the Standard Anatomical Position and its significance. 4. Learn about the various planes used in the study of anatomy. 5. Define the various terms used in anatomy.	1st	2
2	**Tissues** 1.Describe the general features & characteristics of epithelium. 2. Understand the basic structure & functions of Basal Lamina and how it differs from Basement Membrane. 3. Enumerate the types of epithelium and the bases of their classification 4. Define epithelial cell polarity. 5. List and differentiate between the types of cellular junctions. 6. Define connective tissue. 7. Enumerate the various types of cells that are present in this tissue and know their main histological features and functions. 8. Differentiate between the various types of connective tissue. 9. Learn about the main features of adipose tissue. 10. Enumerate the different types of cartilage, its main features and location.	2nd	2
3	**The skin** 1. Define the skin. 2. Know the various layers of the skin and the features of these layers. 3. Describe the appendages of the skin.	3rd	2
4	**Skeletal System** 1. Identify the main features of the osseous tissue. 2. Understand the characteristics of the bones that make up the axial skeleton.	4th	2

	3. Understand the characteristics of the bones that make up the appendicular skeleton. 4. Define joints and know the differences between its various types. 5. Define the terms that are used in describing movements in the joints. 6. Discuss the important features of some of the large joints in the body.		
5	**Muscular system** 1. Identify the main features of muscular tissue and differentiate between the three types of muscles. 2. Take a quick overview of the several muscles present in the regions of the head, neck, thorax, abdomen and the upper and lower limbs.	5th	2
5	**Nervous System** 1. Understand the main features of the nervous tissue. 2. Discuss briefly the characteristics of the structures that make up the central nervous system (brain and spinal cord). 3. Discuss briefly the parts of the peripheral nervous system (the cranial nerves, the spinal nerves and the autonomic nervous system). 4. Know the main differences between the general and special senses. 5. Know the main features of the olfactory epithelium. 6. Know the main features of taste buds. 7. Study the structure of the eye and related structures. 8. Study the structure of the ear.	6th	2
7	**Cardiovascular System** 1. Define Blood and know its various components. 2. Study the main features of the cellular elements that are present in the blood. 3. Define the thoracic cavity and mediastinum. 4. Identify the main features of the heart. 5. Discuss the conducting pathway and the blood supply of the heart. 6. Define the pulmonary and systemic circulation. 7. Take a quick overview of the blood vessels present in the regions of the body.	7th	2
8	**Midterm Exam**	8th	2
9	**Respiratory System** 1. Identify the organs of the respiratory system. 2. Classify these organs structurally and functionally. 3. Discuss the main features of the organs.	9th	2
10	**Lymphatic System** 1. Identify the components of the lymphatic system. 2. Discuss the lymphatic vessels and organs of the lymphatic	10th	2

	system (thymus, lymph nodes and spleen).		
11	**Digestive System** 1. Enumerate the organs of the digestive system. 2. Study the main features of these various organs. 3. Study the main features of the accessory digestive organs and their involvement in the function of the digestive system.	11th	2
12	**Urinary System** 1. List the organs of the renal system. 2. Know the main features and functions of these organs.	12th	2
13	**Endocrine System** 1. Identify the various endocrine glands of the body. 2. Know their main anatomical and histological features.	13th	2
14	**Reproductive System** 1. Know the differences between the male and female reproductive organs. 2. Identify the features of these organs.	14th	2
15	Revision	15th	2
16	Final exam	16th	2
Number of Weeks /and Units Per Semester		**16**	**32**

B – Practical Aspect: *(if any)*

Order	Topics List	Week Due	Contact Hours
1	1- Understand the meaning of the Standard Anatomical Position and its significance. 2- Learn about the various planes used in the study of anatomy.	1st	2
2	List and differentiate between the types of tissues	2nd	2
3	1. Describe the appendages of the skin. 2.Understand the characteristics of the bones that make up the axial skeleton. 3.Understand the characteristics of the bones that make up the appendicular skeleton.	3rd	2
4	Identify the main features of muscular tissue and differentiate between the three types of muscles.	4th	2
5	Discuss briefly the characteristics of the structures that make up the central nervous system (brain and spinal cord).	5th	2
6	1- Define Blood and know its various components. 2. Study the main features of the cellular elements that are present	6th	2

	in the blood. 3. Define the thoracic cavity and mediastinum		
7	**Midterm Exam**	7th	2
8	1- Identify the organs of the respiratory system. 2- Identify the components of the lymphatic system.	8th	2
9	1. Study the main features of these various organs. 2. Study the main features of the accessory digestive organs and their involvement in the function of the digestive system.	9th	2
10	Identify the main features and functions of the urinary and the sexual organs.	10th	2
11	Identify the various endocrine glands of the body.	11th	2
12	**Final exam**	12th	2
Number of Weeks /and Units Per Semester		**12**	**24**

VI. Teaching strategies of the course:

Lecture, Problem- solving exercises
Practical sittings, Videos , modules, seminars, homework
Tutorials, field visits

VII. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Homework	a.1, a.2, a.3, b.1, b.2, b3, d.1, d.2	8th	5
2	Field visit report assessment	a.1, a.2, a.3, b.1, b.2,	10th	5
3	Midterm practical Exam	a.1, a.2, a.3, b.1, b.2, c1, c.2, c.3	7th	10
4	Midterm theoretical Exam	a.1, a.2, a.3, b.1, b.2,	8th	10
5	Final Practical Exam	a.1, a.2, a.3, b.1, b.2, c1, c.2, c.3, d.1, d.2	12th	30
6	Final theoretical Exam	a.1, a.2, a.3, b.1, b.2, c1, d.1, d.2	16th	40

VIII. Schedule of Assessment Tasks for Students During the Semester:

Assessment	Type of Assessment Tasks	Week Due	Mark	Proportion of Final Assessment
1	Homework	8th	5	5%
2	Field visit report assessment	10th	5	5%
3	Midterm practical Exam	7th	10	10%
4	Midterm theoretical Exam	8th	10	10%
5	Final Practical Exam	12th	30	30%
6	Final theoretical Exam	16th	40	40%

IX. Learning Resources:

- Written in the following order: (Author – Year of publication – Title – Edition – Place of publication – Publisher).

1- Required Textbook(s) (maximum two).

1- Principals of Anatomy and Physiology; Gerard J. Tortora. (The recommended textbook).
2- Clinical Anatomy by System; Richard S. Snell.

2- Essential References.

1-Basic Histology Text &Atlas; L C Junqueria & J Carneiro.
4- Di Fiore's Atlas of Histology with Clinical Correlation.

3- Electronic Materials and Web Sites *etc*.

1-
2-
3-

X. Course Policies:

Unless otherwise stated, the normal course administration policies and rules of the Faculty of ----- apply.
For the policy, see: ----------

1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2	**Tardy:** - Any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:**

	- Any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects**: - Assignments and projects will be assessed individually unless the teacher request for group work
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course
6	**Plagiarism**: - Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:**

Course Specification of Pharmaceutical Calculation

I. Course Identification and General Information:

1	Course Title:	Pharmaceutical Calculation				
2	Course Code & Number:	PHA123				
3	Credit hours:	C.H				TOTAL
		Th.	Seminar	practical	Training.	
		2				2
4	Study level/ semester at which this course is offered:	1st year / 2nd semester				
5	Pre –requisite (if any):	Orientation to Pharmacy				
6	Co –requisite (if any):	none				
7	Program (s) in which the course is offered:	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	Language of teaching the course:	English / Arabic				
9	Study System	Semester				
10	Mode of delivery:	Regular				
11	Location of teaching the course:	Al-Saeed University campus				
12	Prepared By:	Dr. Abdulkarim Kassem Alzomor				

II. Course Description:

This course teaches pharmaceutical calculations that are involved in prescriptions. Starting with systems measurement, percentage, preparation of dilute or concentrated solution, adjustment the tonicity and the buffer of the drugs, calculation of the dose and conversion of the international units. Also, this course explains the type of prescription and common symbols used in prescriptions.

III. Course Objectives:

The aim of the course is to:
1- Acquire students with the principles of pharmaceutical calculations.
2- Manage proper and safe dispensing of medicine.
3- Study the types of prescriptions with common symbols used.

IV.	Course Intended learning outcomes (CILOs) of the course	WRITE Symbol and number c PILOs
a.1	Explain the principles of pharmaceutical calculation required to prepared safe and effective dosage form.	**A1**
a.2	Describe the measurement systems and the methods of conversion between these systems.	**A2, A3**
b.1	Evaluate drug prescriptions and dispense the correct drug.	**B3**
b.2	Calculate the proper dose of drugs for adults and pediatrics**.**	**B2, B3**
c.1	Employ proper calculations for preparation of different pharmaceutical preparations**.**	**C1, C2**
c.2	Design and adjust of isotonic solutions.	**C1, C2**
d.1	Employ the technologies services to solve problems of pharmaceutical calculation and develop his skills.	**D1**
d.2	Perform tasks and costs of the course independently and be able to work as an effective member in a team	**D1**

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1- Explain the principles of pharmaceutical calculation required to prepared safe and effective dosage form.	- Lectures and presentation. - Self – learning	Quizzes, Written exam.
a2- Describe the measurement systems and the methods of conversion between these systems.		

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1- Evaluate drug prescriptions and dispense the correct drug.	- Lectures, - Discussions - Brain Storming	- Achievement tests (Written Tests) - Oral Tests
b2- Calculate the proper dose of drugs for adults and pediatrics**.**		

(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1- Employ proper calculations for preparation of different pharmaceutical preparations.	- Lectures, presentation - Problem solving - Cooperative &. Self – learning	Reports' Evaluation.
c2-Design and adjust of isotonic solutions.		

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1- Employ the technologies services to solve problems of pharmaceutical calculation and develop his skills.	- Group discussions - Self – learning - Cooperative learning.	- Homework Evaluation. - Oral Presentation & discussion
d2- Perform tasks and costs of the course independently and be able to work as an effective member in a team		

V. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	contact hours
1	Introduction & Roman numerals	a1, d1	• Definitions, Important of pharmaceutical calculation • Roman numbers (Types, written, reading, and uses in calculation) • problems	1	**2**
2	Systems measurement	a1,a2 b1, c1, d1, d2	• Metric system • Apothecary system • Avoirdupois system • Intersystem conversion • Problems	2	4
3	Common household & Techniques measures	a1, a2, b1, c1, d1, d2	• Household measuring devices • Techniques of pharmaceutical measurement (Balances, Laboratories Tools used for measuring the Liquids). • Problems	1	**2**

4	Quantitative product strength	a1, b1, c1, d1, d2	• Percentage • Ratio strength • Dilution and concentration • Problems	1	**2**
5	Reducing and enlarging formulas	a1, b1, c1, d1, d2	• Reducing and enlarging formulas • Problems	1	**2**
6	• Mid-term exam			1	**2**
7	**Biological fluids and electrolytes**	a1, b1, b2 c1, d1, d2	• Electrolyte solutions and concept of milliequivalent. • Buffers and Buffered solutions. • Isotonic solutions • Problems	3	**6**
8	Drug doses & other subjects	a1, b1, b2 c1, d1, d2	• Density, Temperature and specific gravity • Allegation methods in pharmaceutical sciences • Fundamental concepts of dosage calculations • Dosage calculations based on body surface area (BSA • Problems	3	**6**
9	Prescription	a2, b1, c2, d1.	• Define, Consist. • Types of prescriptions • Prescription Handling • Symbols	2	4
10	Final exam	a1,a2, b1, b2 c1, c2,d1, d2		1	2
			Number of Weeks /and Units Per Semester	**16**	**32**

VI. Teaching strategies of the course:

- Lectures and presentation.
- Discussions
- Brain Storming
- Problem solving
- Self – learning
- Group discussions
- Cooperative learning

VII. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Class attendance and participation	**a1, a2,b1, c1, d1.**	weekly	5
2	Exercises and home work	**a1, a2, b1, b2, c1, c2, d1, d2**	weekly	5
	Total Score			**10**

VIII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Tasks and Assignments	**Weekly**	10	**10%**	**a1, a2, b1, b2, c1, c2, d1, d2**
2	Midterm Exam	**W7**	20	**20%**	**a1, a2,b1, c1, d1, d2**
3	Final Exam (theoretical)	**W16**	70	**70%**	**a1,a2, b1, b2, c1,c2, d1, d2**
Total			100	100%	

IX. Learning Resources:

1- Required Textbook(s) (maximum two).

1. Williams and Wilkins, (2005). Pharmaceutical calculations, 12ed, Lippincott.
2. James Swarbrick, (2006). Encyclopedia of Pharmaceutical Technology, Volume 1, edited by Pharmaceu Tech, Inc. Pinehurst, USA.

2- Essential References.

1- Williams and Wilkins, (2005). Remington; the Science and Practice of Pharmacy, first edition.
2. Patrick J. Sinko (2006). Martin's Physical Pharmacy and Pharmaceutical Sciences.

3- Electronic Materials and Web Sites *etc.*

1- www. Pharmaceutical manufacturing process.com-

X. Course Policies:

1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2	**Tardy:**

	- any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects**: - Assignments and projects will be assessed individually unless the teacher request for group work
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the faculty rules.
7	**Other policies**:

Template for Course Plan (Syllabus) of Pharmaceutical Calculation

I. Information about Faculty Member Responsible for the Course:

		Office Hours					
Name of Faculty Member							
Location& Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Identification and General Information:

1	Course Title:	Pharmaceutical Calculation				
2	Course Code & Number:	PHA123				
3	Credit hours:	C.H				TOTAL
		Th.	Seminar	practical	Training.	
		2				2
4	Study level/ semester at which this course is offered:	*1st* year / 2nd semester				
5	Pre –requisite (if any):	Orientation to Pharmacy				
6	Co –requisite (if any):	none				
7	Program (s) in which the course is offered:	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	Language of teaching the course:	English / Arabic				
9	Study System	Semester				
10	Mode of delivery:	Regular				
11	Location of teaching the course:	Al-Saeed University campus				

III. Course Description:

This course teaches pharmaceutical calculations that are involved in prescriptions. Starting with systems measurement, percentage, preparation of dilute or concentrated solution, adjustment the tonicity and the buffer of the drugs, calculation of the dose and conversion of the international units. Also, this course explains the type of prescription and common symbols used in prescriptions.

IV. Course Objectives:

The aim of the course is to:
1- Acquire students with the principles of pharmaceutical calculations.
2- Manage proper and safe dispensing of medicine.
3- Study the types of prescriptions with common symbols used.

V. Intended learning outcomes (ILOs) of the course:

1- Explain the principles of pharmaceutical calculation required to prepared safe and effective dosage form
2- Describe the measurement systems and the methods of conversion between these systems.
3- Evaluate drug prescriptions and dispense the correct drug.
4- Calculate the proper dose of drugs for adults and pediatrics.
5- Employ proper calculations for preparation of different pharmaceutical preparations.
6- Design and adjust of isotonic solutions.
7- Employ the technologies services to solve problems of pharmaceutical calculation and develop his skills
8- Perform tasks and costs of the course independently and be able to work as an effective member in a team.

VI. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Sub Topics List	Week Due	contact hours
1	Introduction & Roman numerals	• Definitions, Important of pharmaceutical calculation • Roman numbers (Types, written, reading, and uses in calculation) • problems	1st week	2
2	Systems measurement	• Metric system • Apothecary system • Avoirdupois system	2nd week	4
		• Intersystem conversion • Problems	3rd week	
3	Common household & Techniques measures	• Household measuring devices • Techniques of pharmaceutical measurement (Balances, Laboratories Tools used for measuring the Liquids). • Problems	4th week	2

4	Quantitative product strength	• Percentage • Ratio strength • Dilution and concentration • Problems	5th week	**2**
5	Reducing and enlarging formulas	• Reducing and enlarging formulas • Problems	6th week	**2**
6	**Mid-term exam**		7th week	**2**
7	**Biological fluids and electrolytes**	• Electrolyte solutions and concept of milliequivalent.	8th week	**6**
		• Buffers and Buffered solutions. • Isotonic solutions	9th week	
		• Problems	10th week	
8	Drug doses & other subjects	• Density, Temperature and specific gravity	11th week	**6**
		• Allegation methods in pharmaceutical sciences • Fundamental concepts of dosage calculations	12th week	
		• Dosage calculations based on body surface area (BSA • Problems	13th week	
9	Prescription	• Define, Consist. • Types of prescriptions	14th week	4
		• Prescription Handling • Symbols	15th week	
10	Final exam		16th week	2
Number of Weeks /and Units Per Semester			**16**	**32**

VII. Teaching strategies of the course:

- Lectures and presentation.
- Discussions
- Brain Storming
- Problem solving
- Self – learning
- Group discussions
- Cooperative learning

VIII. Assignments:

No	Assignments	Week Due	Mark
1	Class attendance and participation	weekly	5
2	Exercises and home work	weekly	5
	Total Score		**10**

IX. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment
1	Tasks and Assignments	**Weekly**	10	**10%**
3	Midterm Exam	**W8**	20	**20%**
5	Final Exam (theoretical)	**W16**	70	**70%**
	Total		100	100%

X. Learning Resources:

1- Required Textbook(s).

1. Williams and Wilkins, (2005). Pharmaceutical calculations, 12ed, Lippincott.
2. James Swarbrick, (2006). Encyclopedia of Pharmaceutical Technology, Volume 1, edited by Pharmaceu Tech, Inc. Pinehurst, USA.

2- Essential References.

1. Williams and Wilkins, (2005). Remington; the Science and Practice of Pharmacy, first edition.
2. Patrick J. Sinko (2006). Martin's Physical Pharmacy and Pharmaceutical Sciences.

3- Electronic Materials and Web Sites *etc.*

1- www. Pharmaceutical manufacturing process.com-

XI. Course Policies:

1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam.
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.

4	**Assignments & Projects:** - Assignments and projects will be assessed individually unless the teacher request for group work.
5	**Cheating**: **-** Cheating by any means will cause the student failure and he/she must re-study the course.
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:**

Course Specification of Physical Pharmacy

I. Course Identification and General Information:

1	**Course Title:**	**Physical Pharmacy**				
2	**Course Code & Number:**	**PHA151**				
3	**Credit hours:**	C.H				TOTAL
		Th.	Seminar	practical	Training.	
		2		1		3
4	**Study level/ semester at which this course is offered:**	**1st year / 2nd semester**				
5	**Pre –requisite (if any):**	Orientation to Pharmacy				
6	**Co –requisite (if any):**	**None**				
7	**Program (s) in which the course is offered:**	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	**Language of teaching the course:**	English / Arabic				
9	**Study System**	Semester				
10	**Mode of delivery:**	Regular				
11	**Location of teaching the course:**	Al-Saeed University campus				
12	**Prepared By:**	Dr. Abdulkarim Kassem Alzomor				

II. Course Description:

This course deals with study of the various physical phenomena applied or observed in pharmacy in particular pharmaceutical dosage forms design and formulation. Therefore, this course can be referred to as introduction to "pharmaceutics" courses. The course also includes practical part that will help students to apply their learned knowledge.

III. Course Objectives:

This course aims to

1- Introduce students' fundamental aspects of physical pharmacy.
2- Study the principles of solubility, surface and interfacial phenomena, rheology, adsorption and complexation.

IV.	Course Intended learning outcomes (CILOs) of the course	WRITE Symbol and number of PILOs
a.1	Demonstrate sound understanding of physical properties and phenomena that influence the design of pharmaceutical preparations.	**A2**
a.2	Identify adsorption, solubility and solubilization,	**A2, A3**

	interfacial phenomena and surface-active agents and the reaction kinetics and drug degradation pathways.	
b.1	Apply relevant equations to calculate physical measurements related to formulation and stability of pharmaceutical preparations	**B1, B2, B3**
c.1	Handle efficiently and safely the chemical materials and tools used in the laboratory.	**C1**
c.2	Operate the instruments and measure physical properties successfully in the laboratory.	**C1**
d.1	Communicate effectively and behave in discipline with colleagues and in teacher in the lab	**D1**
d.2	Participate efficiently with his colleagues in a team work	**D1**

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1- Demonstrate sound understanding of physical properties and phenomena that influence the design of pharmaceutical preparations.	- Lectures and presentation. Self – learning	Quizzes, Written exam.
a2- Identify adsorption, solubility and solubilization, interfacial phenomena and surface-active agents and the reaction kinetics and drug degradation pathways.		

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1- Apply relevant equations to calculate physical measurements related to formulation and stability of pharmaceutical preparations	- Lectures, - Discussions - Brain Storming	- Achievement tests (Written Tests) - Oral Tests

(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1- Handle efficiently and safely the chemical materials and tools used in the laboratory.	- Lectures, presentation - Problem solving - Cooperative &. Self – learning	Reports' Evaluation.
c2- Operate the instruments and measure physical properties successfully in the laboratory.		

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1- Communicate effectively and behave in discipline with colleagues and in teacher in the lab	- Group discussions - Self – learning - Cooperative learning.	- Homework Evaluation. - Oral Presentation & discussion
d2- Participate efficiently with his colleagues in a team work		

V. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	contact hours
1	**Introduction to physical pharmacy**	a1, a2	• **Scope and purposes** of physical pharmacy • **State of matters :** factors affecting (intermolecular forces, vapor pressure, atmospheric pressure, thermal energy) • **Circle of inter-conversion** of a matter from a state of state ; name of processes, internal and external factors	1	2
2	**Physical properties of solid state**	a1,a2, b1	• **Melting point** • **Micrometrics** ○ Particle size, particle shape ○ Arrangement of particles: Crystals, amorphous, polymorphism, solvate	3	

			(hydrates) ○ Crystallization : principles and applications ○ Tapped and bulk density and porosity ○ Flowability : Carr`s index & angle of repose • **Surface Energy & wettability.**		6
3	**liquid states physical properties**	a1,a2, b1	• **Thermodynamic liquids:** Evaporation, boiling, vaporization and volatilization • **Vapour pressure** • **Viscosity** • Rheology(Newtonian and none Newtonian flow …ect. Thixotropy,.. • **Surface phenomena:** Surface tension, interfacial tension	3	6
4	• Mid-term exam			1	**2**
5	**Physical interactions between matters**	a1,a2, b1	• **Bulk Interactions** ○ Dissolution; solubility, miscibility; ○ Dispersion, Solubilization, & Critical micelles concentration; types and roles of surfactants; factors reducing surfactant activity , HLB ○ Partition coefficient: Hydrophilicity and lipophilicity and role of pH • **Surface interactions** - Adsorption - Complexation • **Transfer of matter:** Diffusion • **Incompatibility**	4	8
6	**Stability and Degradation**	a1,a2, b1	• **Concept of stability** - Definition and types of degradation - Definition and types of stability - Causes of degradation	3	

			- Stabilizers and other approaches to reduce degradation • **Kinetics of stability** - Order of degradation (zero, first, second): equations, rate constants, half-life • Stability determination: accelerated, long-term, shelf life (t_{90})		4
7	**Adsorption & complexation**	a1,a2, b1	Define, Types, Important and Examples	1	2
8	Final exam	a1,a2, b1		1	2
Number of Weeks /and Units Per Semester				**16**	**32**

B - Practical Aspect:

Order	Tasks/ Experiments	Number of Weeks	contact hours	Aligned Course Intended Learning Outcomes CILOs
1.	**Melting point determination by capillary method**	1	2	c1, c2, d1, d2
2.	**Particle size analysis (sieve and sedimentation method),** Microscopic method and counter current method.	2	4	c1, c2, d1, d2
3.	**Crystallization: preparation of salicylic acid crystals**	1	2	c1, c2, d1, d2
4.	**Tapped and bulk density porosity and Carr`s index of flowability description, Angle of repose**	2	4	c1, c2, d1, d2
5.	**Viscosity determination (Ostwald tube) and cone and plate method**	1	2	c1, c2, d1, d2
6.	**Surface tension determination (Capillary or Drop weight method)**	2	4	c1, c2, d1, d2
7.	**Critical micelles concentration (CMC) determination**	1	2	c1, c2, d1, d2
8.	**Partition coefficient determination (salicylic acid between water & ether)**	1	2	c1, c2, d1, d2
9.	**Solubility (partial, immiscible and miscible) solvents**	1	2	c1, c2, d1, d2,
10.	**Effects of pH and temperature on**	1	2	c1, c2, d1, d2,

solubility			
PRACTICAL EXAM	**1**	**2**	**c1, c2, d1, d2**
Number of Weeks /and Units Per Semester	**14**	**28**	

VI. Teaching strategies of the course:

- Lectures and presentation.
- Discussions
- Brain Storming
- Problem solving
- Self – learning
- Group discussions
- Cooperative learning

VII. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Class attendance and participation	**a1, a2, b1, c1, d1, d2**	weekly	5
2	Exercises and home work	**a1, b1, c1, c2, d1, d2**	14	5
Total Score				**10**

VIII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method		Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Assignments		1-14	10	10%	**a1,a2, b1, c1, c2, d1, d2,**
2	Mid-semester exam of theoretical part (written exam		**8**	**10**	**10%**	a1,a2, b1
3	Lab. Term works	Attitude & Report	1-13	10	**10%**	**c1, c2,d1,d2**
		Accomplishments				
4	Final exam (practical)		14	30	30%	**c1, c2,d1,d2**
5	Final exam of theoretical part (written exam)		16	40	40%	**a1, a2, b1, d1, d2**
Total				100	100%	

IX. Learning Resources:

1- Required Textbook(s) (maximum two).	
	1- Martin`s : Physical pharmacy and pharmaceutical sciences, 2011, Lippincott Williams & Wilkins, UK 2- Alexander T. Florence , David Attwood : Physicochemical principles of pharmacy, 4th editio Pharmaceutical Press, 2006
2- Essential References.	
	1. Subrahmanyam. A text book of physical pharmaceutics, 2015, Vallabh Prakashan, India 2. R.S. Gaud G.T. Gupta practical physical pharmacy, 2012, CBS, USA.
3- Electronic Materials and Web Sites *etc.*	
	1- www.pubmed.com

X. Course Policies:

1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** - Assignments and projects will be assessed individually unless the teacher request for group work
5	**Cheating:** Cheating by any means will cause the student failure and he/she must re-study the course
6	**Plagiarism:** Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the faculty rules.

Template for Course Plan (Syllabus) of Physical Pharmacy

I. Information about Faculty Member Responsible for the Course:

Name of Faculty Member		Office Hours					
Location& Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Identification and General Information:

1	Course Title:	Physical Pharmacy				
2	Course Code & Number:	PHA151				
3	Credit hours:	C.H				TOTAL
		Th.	Seminar	practical	Training.	
		2		1		3
4	Study level/ semester at which this course is offered:	1st year / 2nd semester				
5	Pre –requisite (if any):	Orientation to Pharmacy				
6	Co –requisite (if any):	none				
7	Program (s) in which the course is offered:	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	Language of teaching the course:	English / Arabic				
9	Study System	Semester				
10	Mode of delivery:	Regular				
11	Location of teaching the course:	Al-Saeed University campus				

III. Course Description:

This course deals with study of the various physical phenomena applied or observed in pharmacy in particular pharmaceutical dosage forms design and formulation. Therefore, this course can be referred to as introduction to "pharmaceutics" courses. The course also includes practical part that will help students to apply their learned knowledge.

IV. Course Objectives:

This course aims to

1. Introduce students' fundamental aspects of physical pharmacy.
2. Study the principles of solubility, surface and interfacial phenomena, rheology, adsorption and complexation.

V. Intended learning outcomes (ILOs) of the course:

- Brief summary of the knowledge or skill the course is intended to develop:

1. Demonstrate sound understanding of physical properties and phenomena that influence the design of pharmaceutical preparations.
2. Identify adsorption, solubility and solubilization, interfacial phenomena and surface-active agents and the reaction kinetics and drug degradation pathways.
3. Apply relevant equations to calculate physical measurements related to formulation and stability of pharmaceutical preparations.
4. Handle efficiently and safely the chemical materials and tools used in the laboratory.
5. Operate the instruments and measure physical properties successfully in the laboratory.
6. Communicate effectively and behave in discipline with colleagues and in teacher in the lab
7. Participate efficiently with his colleagues in a team work

VI. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Sub Topics List	Week Due	contact hours
1	**Introduction to physical pharmacy**	• **Scope and purposes** of physical pharmacy • **State of matters :** factors affecting (intermolecular forces, vapor pressure, atmospheric pressure, thermal energy) • **Circle of inter-conversion** of a matter from a state of state ; name of processes, internal and external factors	W1	2
2	**Physical properties of solid state**	• **Melting point** • **Micrometrics** ○ Particle size, particle shape ○ Arrangement of particles: Crystals, amorphous,	W2	2
		○ polymorphism, solvate (hydrates) ○ Crystallization: principles and applications ○ Tapped and bulk density and porosity ○ Flowability: Carr`s index & angle of repose	W3 & W4	4

		• **Surface Energy & wettability.**		
3	**liquid states physical properties**	• **Thermodynamic liquids:** Evaporation, boiling, vaporization and volatilization	W5	6
		• **Vapour pressure** • **Viscosity** • Rheology (Newtonian and none Newtonian flow …ect. Thixotropy.	W6	
		• **Surface phenomena:** Surface tension, interfacial tension	W7	
4	Mid-term exam		W8	**2**
5	**Physical interactions between matters**	• **Bulk Interactions** ○ Dissolution; solubility , miscibility; ○ Dispersion , Solubilization, & Critical micelles concentration; types and roles of surfactants; factors reducing surfactant activity , HLB ○ Partition coefficient : Hydrophilicity and lipophilicity and role of pH	W9 & W10	4
		• **Surface interactions** - Adsorption - Complexation • **Transfer of matter:** Diffusion • **Incompatibility**	W11 & W12	4
6	**Stability and Degradation**	• **Concept of stability** - Definition and types of degradation - Definition and types of stability - Causes of degradation - Stabilizers and other approaches to reduce degradation	W13	4

		• **Kinetics of stability** Order of degradation (zero, first, second) : equations, rate constants, half-life • Stability determination: accelerated, long-term, shelf life (t_{90})	W14	
7	**Adsorption & complexation**	Define, Types, Important and Examples	W15	2
8	Final exam		W16	2
Number of Weeks /and Units Per Semester			**16**	**32**

B - Practical Aspect:

Order	Tasks/ Experiments	Number of Weeks	contact hours
1.	**Melting point determination by capillary method**	**W1**	**2**
2.	**Particle size analysis (sieve and sedimentation method) , Microscopic method and counter current method.**	**W2, W3**	**4**
3.	**Crystallization: preparation of salicylic acid crystals**	**W4**	**2**
4.	**Tapped and bulk density porosity and Carr`s index of flowability description, Angle of repose**	**W5, W6**	**4**
5.	**Viscosity determination (Ostwald tube) and cone and plate method**	**W7**	**2**
6.	**Surface tension determination (Capillary or Drop weight method)**	**W8, W9**	**4**
7.	**Critical micelles concentration (CMC)determination**	**W10**	**2**
8.	**Partition coefficient determination (salicylic acid between water & ether)**	**W11**	**2**
9.	**Solubility (partial, immiscible and miscible) solvents**	**W12**	**2**
10.	**Effects of pH and temperature on solubility**	**W13**	
PRACTICAL EXAM		**W14**	**2**
Number of Weeks /and Units Per Semester		**14**	**28**

VII. Teaching strategies of the course:

- Lectures and presentation.
- Discussions
- Brain Storming
- Problem solving
- Self – learning
- Group discussions
- Cooperative learning

VIII. Assignments:

No	Assignments	Week Due	Mark
1	Class attendance and participation	weekly	5
2	Exercises and home work	14	5
Total Score			10

IX. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method		Week Due	Mark	Proportion of Final Assessment
1	Assignments		1-14	10	**10%**
2	Mid-semester exam of theoretical part (written exam		**8**	**10**	**10%**
3	Lab. Term works	Attitude & Report	1-13	10	**10%**
		Accomplishments			
4	Final exam (practical)		14	30	30%
8	Final exam of theoretical part (written exam)		16	40	40%
Total				100	100%

X. Learning Resources:

1- Required Textbook(s) (maximum two).

1- Martin`s: Physical pharmacy and pharmaceutical sciences, 2011, Lippincott Williams & Wilkins, UK
2- Alexander T. Florence , David Attwood : Physicochemical principles of pharmacy, 4th editio Pharmaceutical Press, 2006

2- Essential References.

1. Subrahmanyam. A text book of physical pharmaceutics, 2015, Vallabh Prakashan, India
2. R.S. Gaud G.T. Gupta practical physical pharmacy, 2012, CBS, USA.

3- Electronic Materials and Web Sites *etc.*

1- www.pubmed.com

XI. Course Policies:

1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam.
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** - Assignments and projects will be assessed individually unless the teacher request for group work.
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course.
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:**

Course Specification of Pharmaceutical Botany

I. Course Identification and General Information:

1	Course Title:	Pharmaceutical Botany				
2	Course Code & Number:	PHA171				
3	Credit hours:	C.H				TOTAL
		Th.	Seminar	practical	Training.	
		2		1		3
4	Study level/ semester at which this course is offered:	1st year / 2nd semester				
5	Pre –requisite (if any):	General Biology				
6	Co –requisite (if any):	None				
7	Program (s) in which the course is offered:	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	Language of teaching the course:	English				
9	Study System	Semester				
10	Mode of delivery:	Regular				
11	Location of teaching the course:	University campus				
12	Prepared By:	Dr. Abdulrahman Roshan				

II. Course Description:

The course is designed to provide the student with basic information of plant cell; anatomy, histology, and morphology of pharmaceutically important plants; the diagnostic cell contents; classification of the plant kingdom (Taxonomy), plant families and introduction to pharmacognosy. The course also involves some basic laboratory experiments to help students to apply their knowledge.

III. Course Objectives:

Upon completion of the course,
1- The student should learn the basic knowledge in the field of botany and use of the microscope.
2- The student should describe the plant cell, cell content and plant tissues.
3- The student should apply the knowledge efficiently in macro- and microscopical examinations of different plants organs.
4- The student should study plant classification (taxonomy)
5- The course also prepares the students for coming study of pharmacognosy.

IV.	Course Intended learning outcomes (CILOs) of the course	WRITE Symbol and number of PILOs
a.1	Identify the principles of basic knowledge of pharmaceutical botany and pharmacognosy.	**A2**
a.2	Describe the microscopical properties of plant cell and different plant tissues and the specific characters of each plant organ (stem, leaves, root)**.**	**A2**
b.1	Investigate the different parts of medicinal plants by their botanical and taxonomical features.	**B2**
b.2	Classify some plants morphologically and taxonomically.	**B2**
c.1	Apply the appropriate microscopic techniques for identification and characterization of plant cell content according to good laboratory practice and good safety guidelines.	**C1**
c.2	Integrate different morphological and anatomical aspects to conclude a scientific classification of plants.	**C1**
d.1	Conduct successfully in team working and independently.	**D1**
d.2	Demonstrate the skills of research and communication and professionalism.	**D1, D2, D3**

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1. Identify the principles of basic knowledge of pharmaceutical botany and pharmacognosy.	Lecture and group discussion	Participation, quizzes and written exam
a2. Describe the microscopical properties of plant cell and different plant tissues and the specific characters of each plant organ (stem, leaves, root)**.**		

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1. Investigate the different parts of medicinal plants by their botanical and taxonomical features.	Lecture, discussion and problem based learning, Practical classes	- Written Exams - Oral presentation - Practical Lab Assessments and reports - Problem Solving Exercise
b2. Classify some plants morphologically and taxonomically.		

(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1. Apply the appropriate microscopic techniques for identification and characterization of plant cell content according to good laboratory practice and good safety guidelines.	- Practical class	- practical works, Practical reports and presentations based on their experimental work
c2. Integrate different morphological and anatomical aspects to conclude a scientific classification of plants.		

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1. Conduct successfully in team working and independently.	- Practical class, assignment and discussion in groups	- Reports, presentations and Assignments & Coursework Activities
d2. Demonstrate the skills of research and communication and professionalism.		

V. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	contact hours
1	Introduction to plant anatomy	a1, a2, b2, c1, d1, d2	Plant cell. Plant tissues, meristems and dermal tissue. Ground tissue, conducting tissue and secretory system.	3	6
2	Anatomy (morphological and microstructural) and physiological function of different plant organs	a2, b1, b2, c2, d1, d2	The stem. The root. The leaf.	3	6
	Med-term exam	a1, a2, b1, b2, c2, d1, d2		1	2
	Anatomy	a2, b1, b2, c2, d1,	The flower.	1	2

	(morphological and microstructural) and physiological function of different plant organs	d2			
3	Fruit type	a2, b1, b2, c2, d1, d2	Type, formation and characteristics of fruits.	1	2
4	Introduction to pharmacognosy	a1, b2, c2, d1, d2	History and Scope of pharmacognosy. Classification of crude drugs.	2	4
5	Plant taxonomy	a2, b1, b2, c2, d1, d2	General Taxonomy. Selected plant families.	3	6
6	General revision	a1, a2, b1, b2, c2, d1, d2		1	2
	Final exam	a1, a2, b1, b2, c2, d1, d2		1	2
Number of Weeks /and Units Per Semester				**16**	**32**

B - Practical Aspect:

Order	Tasks/ Experiments	Number of Weeks	contact hours	Learning Outcomes
1	How to use the microscope, how to make slide, safety guidelines in labs, Plant cell structure, examination of Onion cell	**2**	**4**	b1, c1, c2, d1, d2
2	Ergastic cell content starch, vol.& fixed oils, proteins Ca ox & Carbonate	**1**	**2**	b1, c1, c2, d1, d2
3	Dermal tissue (stomata and Trichomes)	**2**	**4**	a2, c1, d1, d2
4	Ground tissue	**1**	**2**	a2, c1, c2, d1, d2
5	Conducting tissue	**1**	**2**	a2, c1, c2, d1, d2
6	Anatomy of stem, root, leaf and Flowers.	**3**	**6**	a2, b1, b2, c1, c2, d1, d2
7	Taxonomical feature of a plant related to a family in the course.	**1**	**2**	a2, b1, b2, c1, c2, d1, d2
8	Presentation of the assignment.	**1**	**2**	a2, b1, b2, d1, d2
9	Revision	**1**	**2**	a2, b1-b2, c1-c2, d1-

				d2
10	Practical exam	**1**	**2**	a2, b1-b2, c1-c2, d1-d2
Number of Weeks /and Units Per Semester		**14**	**28**	

VI. Teaching strategies of the course:

Lecture and group discussion
Problem based learning
Practical classes
Assignment

VII. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Lab report	**a2, b1, b2, c1, c2, d1, d2**	1-6, 8-11	10%
2	Research assignment	**a2, b1, b2, c2, d1, d2**	12	5%

VIII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Attendance/ quiz	All	5	5%	
2	Lab reports	1-6, 8-11	10	10%	a2, b1, b3, c2, c3, d1, d2
3	Med- Term Exam	7	10	10%	a1, a2, b2, b4, c2, d1, d2
4	Research assignment	12	5	5%	a2, a3, b1, b2 ,d1- d3
5	Practical exam	14	30	30%	a2-a3, b1-b4, c1-c4, d1-d2
6	Final written exam	16	40	40%	a1-a4, b2-b4, c2, c3, d1, d2
7	TOTAL			100	**100%**

IX. Learning Resources:

1- Required Textbook(s) (maximum two).	
	1- Paula J. Rudall. (2007). Anatomy of Flowering Plants An Introduction to Structure and Development (3rd Edition), Cambridge University Press, New York. 2- Evans, William Charles, Evans, Daphne, & Trease, George Edward. (2009). Trease and Evans pharmacognosy (16th ed. / rev. with the assistance of Daphne Evans.). Saunders/Elsevier.
2- Essential References.	
	1- Janice Glimn-Lacy (2006).Botany illustrated Introduction to Plants, Major Groups, Flowering Plant Families (2nd). Springer. 2-
3- Electronic Materials and Web Sites *etc*.	
	1- http://www.botanical.com

X. Course Policies:

1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects**: - Assignments and projects will be assessed individually unless the teacher request for group work
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the faculty rules.

Template for Course Plan (Syllabus) of Pharmaceutical Botany

I. Information about Faculty Member Responsible for the Course:

		Office Hours					
Name of Faculty Member							
Location& Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Identification and General Information:

1.	Course Title:	Pharmaceutical Botany				
2.	Course Number & Code:	PHA171				
3.	Credit hours:	C.H				Total
		Th.	Seminar	Pr.	F. Tr.	
		2		1		3
4.	Study level/year at which this course is offered:	*1st year / 2nd semester*				
5.	Pre –requisite (if any):	None				
6.	Co –requisite (if any):	None				
7.	Program (s) in which the course is offered	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8.	Language of teaching the course:	English				
9.	System of Study:	Semester				
10.	Mode of delivery:	Regular				
11.	Location of teaching the course:	University campus				

III. Course Description:

The course is designed to provide the student with basic information of plant cell; anatomy, histology, and morphology of pharmaceutically important plants; the diagnostic cell contents; classification of the plant kingdom (Taxonomy), plant families and introduction to pharmacognosy.

IV. Course Objectives:

Upon completion of the course,
1- The student should learn the basic knowledge in the field of botany and use of the microscope.
2- The student should describe the plant cell, cell content and plant tissues.
3- The student should apply the knowledge efficiently in macro- and microscopical examinations of different plants organs.
4- The student should study plant classification (taxonomy)
5- The course also prepares the students for coming study of pharmacognosy.

V. Intended learning outcomes (ILOs) of the course:

- Brief summary of the knowledge or skill the course is intended to develop:

1- Identify the principles of basic knowledge of pharmaceutical botany and pharmacognosy.
2- Describe the microscopical properties of plant cell and different plant tissues and the specific characters of each plant organ (stem, leaves, root).
3- Investigate the different parts of medicinal plants by their botanical and taxonomical features.
4- Classify some plants morphologically and taxonomically.
5- Apply the appropriate microscopic techniques for identification and characterization of plant cell content according to good laboratory practice and good safety guidelines.
6- Integrate different morphological and anatomical aspects to conclude a scientific classification of plants.
7- Conduct successfully in team working and independently.
8- Demonstrate the skills of research and communication and professionalism.

VI. Course Content:

- Distribution of Semester Weekly Plan of Course Topics/Items and Activities.

A – Theoretical Aspect:

Order	Topics List	Week Due	Contact Hours
1	Introduction to plant cell anatomy	1st	2
2	Plant tissues, meristems and dermal tissue.	2nd	2
3	Ground tissue, conducting tissue and secretory system.	3rd	2
4	Anatomy (morphological and microstructural) and physiological function of the stem.	4th	2
5	Anatomy (morphological and microstructural) and physiological function of the root.	5th	2
6	Anatomy (morphological and microstructural) and physiological function of the leaf.	6th	2

7	Med-term Exam	7th	2
8	Anatomy (morphological and microstructural) and physiological function of the flower.	8th	2
9	Types, formation and characteristics of fruits.	9th	2
10	Introduction to pharmacognosy (History and Scope of pharmacognosy)	10th	2
11	Introduction to pharmacognosy (Classification of crude drugs)	11th	2
12	General Taxonomy (Selected plant families).	12th	2
13	General Taxonomy (Selected plant families).	13th	2
14	General Taxonomy (Selected plant families).	14th	2
15	General revision	15th	2
16	Final examination	16th	2
Number of Weeks /and Units Per Semester		**16**	**32**

B – Practical Aspect: ***(if any)***

Order	Topics List	Week Due	Contact Hours
1	How to use the microscope, how to make slide, safety guidelines in labs,	1st	**2**
2	Plant cell structure, examination of Onion cell	2nd	**2**
3	Ergastic cell content starch, vol.& fixed oils, proteins Ca ox & Carbonate	3rd	**2**
4	Dermal tissue (stomata)	4th	**2**
5	Dermal tissue appendages (Trichomes)	5th	**2**
6	Ground tissue	6th	**2**
7	Conducting tissue	7th	**2**
8	Anatomy of stem.	8th	**2**

9	Anatomy of root.	9th	**2**
10	Anatomy of leaf and Flowers.	10th	**2**
11	Taxonomical feature of a plant related to a family in the course.	11th	**2**
12	Presentation of the assignment.	12th	**2**
13	Revision	13th	**2**
14	Practical exam	14th	**2**
Number of Weeks /and Units Per Semester		**14**	**28**

VII. Teaching strategies of the course:

Lecture and group discussion
Problem based learning
Practical classes
Assignment

VIII. Assignments:

No	Assignments	Week Due	Mark
1	Lab report	1-6, 8-11	10%
2	Research assignment	12	5%

IX. Schedule of Assessment Tasks for Students During the Semester:

Assessment	Type of Assessment Tasks	Week Due	Mark	Proportion of Final Assessment
1	Attendance/ quiz	All	5	5%
2	Lab reports	1-6, 8-11	10	10%
3	Med- Term Exam	7	10	10%
4	Research assignment	12	5	5%
5	Practical exam	14	30	30%
6	Final written exam	16	40	40%
7	TOTAL		100	100%

X. Learning Resources:

1- Required Textbook(s) (maximum two).

1- Paula J. Rudall. (2007). Anatomy of Flowering Plants An Introduction to Structure and Development (3rd Edition), Cambridge University Press, New York .
2- Evans, William Charles, Evans, Daphne, & Trease, George Edward. (2009). Trease and Evans pharmacognosy (16th ed. / rev. with the assistance of Daphne Evans.). Saunders/Elsevier.

2- Essential References.

1- Janice Glimn-Lacy (2006). Botany illustrated Introduction to Plants, Major Groups, Flowering Plant Families (2nd). Springer.

3- Electronic Materials and Web Sites *etc*.

1- http://www.botanical.com

XI.Course Policies:

1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam.
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** - Assignments and projects will be assessed individually unless the teacher request for group work.
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course.
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:**

Second Level, First Semester

Course Specification of Microbiology

I. Course Identification and General Information:

1	Course Title:	Microbiology				
2	Course Code & Number:	MED213				
3	Credit hours:	C.H				TOTAL
		Th.	Seminar	practical	Training.	
		2		1		3
4	Study level/ semester at which this course is offered:	Second level, first semester				
5	Pre –requisite (if any):	General Biology				
6	Co –requisite (if any):	None				
7	Program (s) in which the course is offered:	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	Language of teaching the course:	English Language				
9	Study System	Semester				
10	Mode of delivery:	Regular				
11	Location of teaching the course:	University campus				
12	Prepared By:	Dr. Waheed A M Alsowaidy				

II. Course Description:

A study of the biological characteristics of different groups of microorganisms; their classification, morphology, anatomy, chemistry, nutrition, metabolism, biosynthesis, growth and genetics. The study includes principles of microbe-host interactions and pathogenesis of infections. The course also includes practical part that will help students to apply their learned knowledge.

III. Course Objectives:

- To provide a good knowledge about the cell structure (Prokaryotes & Eukaryotes). And to describe in details typical and atypical forms of bacteria, viruses (virology) and fungi (mycology).
- To clarify different mechanisms of transport across bacterial cell membrane, metabolic pathways and physiology of bacteria.
- To provide students with the principles of microbial genetics.
- To provide the student with a knowledge and understanding of microbe-host interactions, infectious diseases, and their modes of spread.
- Develop the ability to manipulate the laboratory tests to identify pathogenic microorganisms.

IV. Course Intended learning outcomes (CILOs) of the course		WRITE Symbol and number of PILOs
a.1	Describe the basic structure of bacteria, atypical forms of bacteria, fungi and viruses (cytoplasm structures, cell wall and cell membrane**).**	**A1**
a.2	Define the different mechanisms of transport across bacterial cell membrane, metabolic pathways and physiology of bacteria.	**A2**
a.3	Enumerate and categorize bacterial, viral and fungal pathogens and describe their modes of transmission, infection patterns and pathogenic mechanisms.	**A4**
a.4	Identify microbial genetic structure, functions and genetic variation.	**A1**
b.1	Recommend the best protective and prophylactic method against infectious disease.	**B4**
c.1	Handle and dispose hazardous microbiological preparation safely and perform isolation and identification of microorganisms causing microbial infections.	**C1**
c.2	Operate different types of microbiological techniques and perform lab works under aseptic conditions.	**C4**
d.1	Interact effectively in team working.	**D3**

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1- Describe the basic structure of bacteria, atypical forms of bacteria, fungi and viruses (cytoplasm structures, cell wall and cell membrane**).**	Lectures, diagrams, photos and videos Discussion	Written exams Assignments.
a2- Define the different mechanisms of transport across bacterial cell membrane, metabolic pathways and physiology of bacteria.	Lectures and photos Discussion	Written exams
a3- Enumerate and categorize bacterial, viral and fungal pathogens and describe their modes of transmission, infection	Lectures and diagrams	Written exams Assignments.

patterns and pathogenic mechanisms.	Discussion	
a4- Identify microbial genetic structure, functions and genetic variation.	Lectures and diagrams Discussion	Written exams Assignments.

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1- Recommend the best protective and prophylactic method against infectious disease.	Lectures, Practical training Discussion	Assignments, practical exams.

(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1- Handle and dispose hazardous microbiological preparation safely and perform isolation and identification of microorganisms causing microbial infections.	Lab training, visits to central labs in the city	Practical exams and reports
c2- Operate different types of microbiological techniques and perform lab works under aseptic conditions.	Practical lectures and training	Practical exams

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1- Interact effectively in team working.	Theoretical lectures and seminars	Group presentation

V. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	contact hours
1	Introduction	a1, a2,	Introduction to microbiology, Prokaryotes & Eukaryotes Bacterial taxonomy Bacterial morphology	1	2
2	Anatomy of bacteria-1	a1, a2, a3	Cell wall structure in gram	1	2

			positive and gram negative bacteria		
3	Anatomy of bacteria-2	a1, a2, a3, a4	Structure of bacterial cell membrane and transport mechanisms	1	2
4	Bacterial nutrition, metabolism and growth	a1a2, a3	- Phases of bacterial growth, growth curve, etc - Nutritional requirements of bacteria - Aerobic and anaerobic metabolism.	1	2
5	Atypical bacteria	a1, a2	Atypical bacteria	1	2
6	Bacterial genetics	a1-a4	DNA structure- DNA replication Reproduction, mutation and gene transports	2	4
7	**Mid-Term Exam**	a1, a2, a3, a4,b1, d1		1	2
8	Mycology	a1- a4	Fungal structures Fungal classification Fungal infection	2	4
9	Virology	a1- a4	Viral structure Viral classification Viral replication	2	4
10	Host-microbe interaction – introduction to infectious diseases	a4, a4, b1, d1	Host parasite relationship Infectious diseases Risk factors Invasion and spread	3	6
11	**Final exam**	a1,a2,a3,a4,b1,d1		1	2
Number of Weeks /and Units Per Semester				**16**	**32**

B - Practical Aspect: (if any)

Order	Tasks/ Experiments	Number of Weeks	contact hours	Learning Outcomes
1	Introduction: Safety & Microscope	1	2	c1,c2, d1
2	Culture media	1	2	c1,c2, d1
3	Aseptic technique – Isolation	2	4	c1,c2, d1
4	Simple stain	1	2	c1,c2, d1
5	**Mid-Term exam**	1	2	c1,c2,c3, d1

6	Gram staining	2	4	c1,c2, d1
7	Acid fast stain	1	2	c1,c2, d1
8	Spore staining	1	2	c1,c2, d1
9	Capsule staining	1	2	c1,c2, d1
10	**Final Exam**	1	2	c1,c2, d1
Number of Weeks /and Units Per Semester		**12**	**24**	

VI. Teaching strategies of the course:

Lectures, diagrams, photos and videos
Discussion
Practical training
Practical lectures and training
Field visits
Seminars

VII. Assignments:

No	Assignments	Aligned CILOs (symbols)	Week Due	Mark
1	Home works	a1,a2,a3,a4,b1,d1	Continually	5
2	Field visit reports	a1,a2,a3,a4, b1,d1	3th and 8th	5

VIII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Home works	Continually	5	5%	a1,a2,a3,a4,b1,d1
2	Field visit reports	3th and 8th	5	10%	a1,a2,a3,a4,a, b1,d1
3	Practical laboratory work	1-11th	10	10%	c1,c2,c3,d1
4	Mid-term written exam	8th	10	10%	a1, a2, a3, a4, d1
5	Final practical exam	12th	30	30%	c1,c2,c3,d1
6	Final written exam	16th	40	40%	a1,a2,a3,a4,,b1,d1
7	Total		100	100	

IX. Learning Resources:

- *Written in the following order: (Author - Year of publication – Title – Edition – Place of publication – Publisher).*

1- Required Textbook(s) (maximum two).

1- Pharmaceutical microbiology, AshutoshKar, 1st edition, 2008
2- Medical Microbiology and Immunology, Levinson, W., 12th edition, 2016-

2- Essential References.

1- Medical Microbiology, Brooks, G., 24th edition, 2007.
2- Subhash Parija. 2016. Textbook of Microbiology and Immunology, India

3- Electronic Materials and Web Sites *etc*.

- **Periodicals, Web sites, Etc:**
- Journal of Microbiology and Immunology
- http://www.microbiologybook.org/

X. Course Policies:

1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2	**Tardy:** - Any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** - Assignments and projects will be assessed individually unless the teacher request for group work
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:** -

I. Information about Faculty Member Responsible for the Course:

		Office Hours					
Name of Faculty Member							
Location& Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Identification and General Information:

1	Course Title:	Microbiology				
2	Course Number & Code:	MED213				
3	Credit hours:	C.H				Total
		Th.	Seminar	Pr.	F. Tr.	
		2		1		3
4	Study level/year at which this course is offered:	Second level, first semester				
5	Pre –requisite (if any):	Biology				
6	Co –requisite (if any):	None				
7	Program (s) in which the course is offered	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	Language of teaching the course:	English Language				
9	System of Study:	Semester				
10	Mode of delivery:	Regular				
11	Location of teaching the course:	University campus				

III. Course Description:

A study of the biological characteristics of different groups of microorganisms; their classification, morphology, anatomy, chemistry, nutrition, metabolism, biosynthesis, growth and genetics. The study includes principles of microbe-host interactions and pathogenesis of infections. The course also includes practical part that will help students to apply their learned knowledge.

IV. Course Objectives:

- To provide a good knowledge about the cell structure (Prokaryotes & Eukaryotes). And to describe in details typical and atypical forms of bacteria, viruses (virology) and fungi (mycology).
- To clarify different mechanisms of transport across bacterial cell membrane, metabolic pathways and physiology of bacteria.
- To provide students with the principles of microbial genetics.
- To provide the student with a knowledge and understanding of microbe-host interactions, infectious diseases, and their modes of spread.
- Develop the ability to manipulate the laboratory tests to identify pathogenic microorganisms.

V. Intended learning outcomes (ILOs) of the course:

Brief summary of the knowledge or skill the course is intended to develop:

- Describe the basic structure of bacteria, atypical forms of bacteria, fungi and viruses (cytoplasm structures, cell wall and cell membrane).
- Define the different mechanisms of transport across bacterial cell membrane, metabolic pathways and physiology of bacteria.
- Enumerate and categorize bacterial, viral and fungal pathogens and describe their modes transmission, infection patterns and pathogenic mechanisms.
- Identify microbial genetic structure, functions and genetic variation.
- Recommend the best protective and prophylactic method against infectious disease.
- Handle and dispose hazardous microbiological preparation safely and perform isolation a identification of microorganisms causing microbial infections.
- Operate different types of microbiological techniques and perform lab works under asepti conditions.
- Interact effectively in team working.

VI. Course Content:

- Distribution of Semester Weekly Plan of Course Topics/Items and Activities.

A – Theoretical Aspect:

Order	Topics List	Week Due	Contact Hours
1	**Introduction:** - Introduction to microbiology, - Prokaryotes & Eukaryotes - Bacterial taxonomy - Bacterial morphology	1st	2
2	**Anatomy of bacteria-1** **- Cell wall structure in gram positive and gram negative bacteria**	2nd	2
3	**Anatomy of bacteria-2** Structure of bacterial cell membrane and transport mechanisms	3rd	2
4	**Bacterial nutrition, metabolism and growth:** - Phases of bacterial growth, growth curve, etc - Nutritional requirements of bacteria - Aerobic and anaerobic metabolism.	4th	2
5	**Atypical bacteria**	5th	2
6	**Bacterial genetics:** DNA structure- DNA replication Reproduction, mutation and gene transports	6th 7th	4

7	**Mid-Term Exam**	8th	2
8	**Mycology:** Fungal structures Fungal classification Fungal infection	9th, 10th	4
9	**Virology:** Viral structure Viral classification Viral replication	11th, 12th	4
10	**Host-microbe interaction – introduction to infectious diseases:** Host parasite relationship Infectious diseases Risk factors Invasion and spread	13th, 14 th, 15 th	6
11	**Final exam**	16th	2
Number of Weeks /and Units Per Semester		**16**	**32**

B – Practical Aspect: ***(if any)***

Order	Topics List	Week Due	Contact Hours
1	Introduction: Safety & Microscope	1st	2
2	Culture media	2nd	2
3	Aseptic technique – Isolation	3rd, 4th	4
4	Simple stain	5th	2
5	**Mid-Term exam**	6th	2
6	Gram staining	7th, 8th	4
7	Acid fast stain	9th	2
8	Spore staining	10th	2
9	Capsule staining	11th	2

10	**Final Exam**	12th	2
Number of Weeks /and Units Per Semester			

VII. Teaching strategies of the course:

Lectures, diagrams, photos and videos
Discussion
Practical training
Practical lectures and training
Field visits
Seminars

VIII. Assignments:

No	Assignments	Week Due	Mark
1	Home works	Continually	5
2	Field visit reports	3th and 8th	5

IX. Schedule of Assessment Tasks for Students During the Semester:

Assessment	Type of Assessment Tasks	Week Due	Mark	Proportion of Final Assessment
1	Home works	Continually	5	5%
2	Field visit reports	3th and 8th	5	10%
3	Practical laboratory work	1-11th	10	10%
4	Mid-term written exam	8th	10	10%
5	Final practical exam	12th	30	30%
6	Final written exam	16th	40	40%
7	Total		100	100

X. Learning Resources:

- Written in the following order: (Author – Year of publication – Title – Edition – Place of publication – Publisher).

1- Required Textbook(s) (maximum two).

1- Pharmaceutical microbiology, AshutoshKar, 1st edition, 2008

2- Medical Microbiology and Immunology, Levinson, W., 12th edition, 2016
2- Essential References.
1- Medical Microbiology, Brooks, G., 24th edition, 2007. 2- Subhash Parija. 2016. Textbook of Microbiology and Immunology, India
3- Electronic Materials and Web Sites *etc*.
- Journal of Microbiology and Immunology - http://www.microbiologybook.org/

XI. Course Policies:	
1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2	**Tardy:** - Any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** - Assignments and projects will be assessed individually unless the teacher request for group work
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:**

Course Specification of Organic Chemistry

I. Course Identification and General Information:

1	**Course Title:**	**Organic chemistry**				
2	**Course Code & Number:**	**MED214**				
3	**Credit hours:**	C.H				TOTAL
		Th.	Seminar	practical	Training.	
		2	-	1	-	**3**
4	**Study level/ semester at which this course is offered:**	Second Year / First Semester				
5	**Pre –requisite (if any):**	**General Chemistry**				
6	**Co –requisite (if any):**					
7	**Program (s) in which the course is offered:**	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	**Language of teaching the course:**	**English**				
9	**Study System**	Semester				
10	**Mode of delivery:**	**Regular**				
11	**Location of teaching the course:**	**University campus**				
12	**Prepared By:**	**Prof. Dr. Abdullah A. Alkarim Al-Shara´ey**				

II. Course Description:

This course is concerned with studying of aliphatic organic compounds, it includes: alkanes, alkenes, alkynes, alkyl halides and nucleophilic substitution reactions, alcohols, ethers, aliphatic amines, (aliphatic aldehydes and ketones) and (aliphatic carboxylic acids and their derivatives). Their chemical and physical properties, preparation, reactivity and reactions. It also covers stereochemistry of organic compounds; chirality, enantiomers, diastereoismers, conformational isomers and geometrical isomerism. The students will also apply knowledge in performing some basic laboratory experiments.

III. Course Objectives:

The course aims to enable students to:

- Define and classify the aliphatic organic compounds.
- Use the (IUPAC) rule for naming of aliphatic organic compounds
- Recognize the function groups in aliphatic hydrocarbons and their derivatives
- Understand the basic principles of organic reactions and synthesis
- Choose the suitable organic molecule to synthesis other compounds
- Identify the physical and chemical properties for aliphatic organic compounds
- Explain the effect of stereochemistry in organic structure and reactivity
- Use the lab equipment, chemical, solvents to determine the physical and chemical properties.

IV.	Course Intended learning outcomes (CILOs) of the course	VRITE Symbol and number of PILOs
a.1	Define and classify the aliphatic organic compounds and explain the effect of function groups in organic compounds	A2
a.2	Describe the importance of reagents and solvents in synthesis and reactions of organic compounds.	A3
a.3	Represent the stereochemistry (Isomers and stereoisomers) for some different aliphatic organic compounds.	A2
b.1	Predict the IUPAC name for aliphatic organic compounds.	B1
b.2	Design strategy for synthesis and reaction of some organic compounds.	B2
c.1	Perform different chemical tests effectively and safely.	C1
c.2	Use the laboratory techniques to identify functional groups of aliphatic organic compounds	C1
d.1	Cooperate with his colleagues as one team while working in organic chemistry lab and through prepared common report and other activities.	D3

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1- Define and classify the aliphatic organic compounds and explain the effect of function groups in organic compounds	- lecture (Material presentation, illustration with	- Quizzes - Written exam - Practical work

a2- Describe the importance of reagents and solvents in synthesis and reactions of organic compounds.	examples and discussion). - Problem analysis and problem solving - Explanation - consulting	- Assignments
a3- Represent the stereochemistry (Isomers and stereoisomers) for some different aliphatic organic compounds.		

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1- Predict the IUPAC name for aliphatic organic compounds.	-Lectures - Practical interaction - Lab discussions - Literature analysis	- Quizzes - Written exam - Problem solvent
b2- Design strategy for synthesis and reaction of some organic compounds.		

(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1- Perform different chemical tests effectively and safely.	- Practical work material - Practical problem Solution - Individual student work	Practical assessment and lab reports
c2- Perform different chemical tests effectively and safely.		

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1- Cooperate with his colleagues as one team while working in organic chemistry lab and through prepared common report and other activities.	- Practical - Information analysis - Lab report discussions	- Practical assessment and discussion lab reports

V. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	contact hours
1	Basic concepts of organic chemistry	a1-a3 b1, b2	Writing structural formulas Types of hybridization		2

			Type of chemical bonds	1	
			Types of function groups		
2	Alkanes and cycloalkanes		Definition and classification	1	2
			Nomenclature by using IUPAC rules		
			Physical properties		
			Preparation and reactions		
3	Alkenes and cycloalkenes		Definition and classification	1	2
			Nomenclature		
			Physical properties of		
			Preparation and reactions		
4	Alkynes		Definition	1	2
			Nomenclature		
			Physical properties		
			Preparation and reactions		
5	Alkyl halides and Nucleophilic Substitution Reactions		Definition and classification	1	2
			Nomenclature		
			Synthesis		
			Nucleophilic substitution reactions (S_N^1 and S_N^2 mechanism)		
			Elimination reaction (E1 and E2)		
6	Alcohols and Ethers	a1-a3 b1, b2	Definition and classification	1	2
			Nomenclature		
			Physical properties		
			Synthesis		
			Reactions		
7	**Mid-Term exam**			1	
8	Aliphatic Amines	a1-a3 b1, b2	Definition and classification	1	2
			Nomenclature		
			Physical properties		
			Preparation and reactions		
9	Aliphatic Aldehydes and Ketones		Nomenclature and physical properties	1	2
			Some common aldehydes and ketons		
			Synthesis		
			Reactions		
10			Nomenclature and physical		

	Aliphatic carboxylic acids & their derivatives		properties Acidity and acidity constants Synthesis Reactions	**1**	2
11	Stereochemistry		Definition and classification Constitutional isomers:- - Chain and cyclic isomers - position isomers - Function groups isomers	**1**	2
12	Stereochemistry		Stereoisomers a- Configurational isomers:- - Enantiomers - Diastereoisomers - Meso isomers Designing of configuration (R & S)	**1**	2
13	Stereochemistry		Stereoisomers b- Geometrical isomers - Cis & Trans - Z & E	**1**	2
14	General Revision	a1-a3 b1, b2	General revision about the above subjects	**1**	2
15	**Final Exam**			**1**	2
Number of Weeks /and Units Per Semester				**15**	**30**

B - Practical Aspect:

Order	Tasks/ Experiments	Number of Weeks	contact hours	Learning Outcomes
1	Introduction and laboratory safety	**1**	**2**	**C1**
2	Physical Characters and Solubility	**1**	**2**	**a1, B2,b3**
3	Physical Characters and Solubility	**1**	**2**	**b2, c1-c2, d1**
4	Chemical reactions	**1**	**2**	
5	Application on physical and chemical reactions	**1**	**2**	**a1,a2,a3, b1,b2, c1-c2, d1**
6	Identification of Alkane, Alkenes and Alkynes	**1**	**2**	
7	**Mid-Term exam**	**1**	**2**	**a1,a2,a3, b1,b2, c1-c2, d1**
8	Identification of Alcohols	**1**	**2**	**a1,a2,a3, b1,b2, c1-c2, d1**
9	Identification of Aldehydes and Ketones	**1**	**2**	

10	Identification of Aliphatic Carboxylic Acids and Salts	**1**	**2**	
11	Identification of Aliphatic Carboxylic Acids and Salts	**1**	**2**	
12	Identification of Esters and Amides	**1**	**2**	
13	General Revision	**1**	**2**	**a1,a2,a3, b1,b2, c1-c2, d1**
14	**Practical Exam**	**1**	**2**	**a1,a2,a3, b1,b2, c1-c2, d1**
Number of Weeks /and Units Per Semester		**14**	**28**	

VI. Teaching strategies of the course:

- Lecture (material presentation, illustration with examples and discussion.
- Problem analysis and problems' solution.
- Explanation and consulting.
- Practical work material, practical problem solution, individual student's work.

VII. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	**Participation, assignments, problem solving and quizzes**	**a1,a2,a3, b1,b2, c1-c2, d1**	3-12 w	10

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment
1	**Participation, assignments, problem solving and quizzes**	3-12 w	10	10 %
2	**Midterm exam**	7 W	10	10%
3	**Final exam (theoretical)**	15 W	40	40 %
4	**Practical work**	2-13 W	10	10 %
5	**Final exam (practical) and lab report**	14 W	30	30 %
6	**Total**		**100**	**100%**

VIII. Learning Resources:

1- Required Textbook(s) (maximum two).	
	1- Organic Chemistry, A Short Course, Dived J. Hart; Christopher M. Hadad; Leslie E. Craine and Harold Hart. Cengage Learning 2010. 2- A Microscale Approach to Organic Laboratory Techniques, Donald L. Pavia, Gary M. Lampman, George S. Kriz, Randall G. Engel, 4th Ed., 2016
2- Essential References.	
	1- Organic Chemistry, T. W. Graham Solomons, Craig B. Fryhle, and Scott A. Snyder11th Ed., 2014. 2- Organic Chemistry, Textbook Website; Francis A. Carey; McGraw-Hill, 2001 3- Vogel's Quantitative Chemical Analysis, J. Mendham, R.C. Denney, J. D. Barnes, M.J.K. Thomas, 6th Ed., 2006.
3- Electronic Materials and Web Sites *etc*.	
	1- Power Point Presentation (PPT and /or Pdf) Slides for Lectures Delivery.

IX. Course Policies:	
1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects**: - Assignments and projects will be assessed individually unless the teacher request for group work
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course

6	**Plagiarism:** Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:** -

Template for Course Plan (Syllabus) of Organic chemistry

I. - Information about Faculty Member Responsible for the Course:

		Office Hours					
Name of Faculty Member							
Location& Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Identification and General Information:

1.	Course Title:	Organic chemistry				
2.	Course Number & Code:	MED214				
3.	Credit hours:	C.H				Total
		Th.	Seminar	Pr.	F. Tr.	
		2	-	1	-	3
4.	Study level/year at which this course is offered:	Second year / First Semester				
5.	Pre –requisite (if any):	General Chemistry				
6.	Co –requisite (if any):					
7.	Program (s) in which the course is offered	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8.	Language of teaching the course:	English				
9.	System of Study:	Semester				
10.	Mode of delivery:	Regularly				
11.	Location of teaching the course:	University campus				

III. Course Description:

This course is concerned with studying of aliphatic organic compounds, it includes: alkanes, alkenes, alkynes, alkyl halides and nucleophilic substitution reactions, alcohols, ethers, aliphatic amines, (aliphatic aldehydes and ketones) and (aliphatic carboxylic acids and their derivatives). Their chemical and physical properties, preparation, reactivity and reactions. It also covers stereochemistry of organic compounds; chirality, enantiomers, diastereoismers, conformational isomers and geometrical isomerism. The students will also apply knowledge in performing some basic laboratory experiments.

IV. Course Objectives:

The course aims to enable students to:

1- Define and classify the aliphatic organic compounds.
2- Use the (IUPAC) rule for naming of aliphatic organic compounds
3- Recognize the function groups in aliphatic hydrocarbons and their derivatives
4- Understand the basic principles of organic reactions and synthesis
5- Choose the suitable organic molecule to synthesis other compounds
6- Identify the physical and chemical properties for aliphatic organic compounds
7- Explain the effect of stereochemistry in organic structure and reactivity
8- Use the lab equipment, chemical, solvents to determine the physical and chemical properties.

V. Intended learning outcomes (ILOs) of the course:

Brief summary of the knowledge or skill the course is intended to develop**:**

- Define and classify the aliphatic organic compounds and explain the effect of function groups in organic compounds
- Describe the importance of reagents and solvents in synthesis and reactions of organic compounds.
- Represent the stereochemistry (Isomers and stereoisomers) for some different aliphatic organic compounds.
- Predict the IUPAC name for aliphatic organic compounds.
- Design strategy for synthesis and reaction of some organic compounds.
- Perform different chemical tests effectively and safely.
- Use the laboratory techniques to identify functional groups of aliphatic organic compounds
- Cooperate with his colleagues as one team while working in organic chemistry lab and through prepared common report and other activities.

VI. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Sub Topics List	Week due	contact hours
1	Basic concepts of organic chemistry	Writing structural formulas	1	2
		Types of hybridization		
		Type of chemical bonds		
		Types of function groups		
2	Alkanes and cycloalkanes	Definition and classification	2	2
		Nomenclature by using IUPAC rules		
		Physical properties		
		Preparation and reactions		

3	Alkenes and cycloalkenes	Definition and classification Nomenclature Physical properties of Preparation and reactions	**3**	2
4	Alkynes	Definition Nomenclature Physical properties Preparation and reactions	**4**	2
5	Alkyl halides and Nucleophilic Substitution Reactions	Definition and classification Nomenclature Synthesis Nucleophilic substitution reactions (S_N^1 and S_N^2 mechanism) Elimination reaction (E1 and E2)	**5**	2
6	Alcohols and Ethers	Definition and classification Nomenclature Physical properties Synthesis Reactions	**6**	2
7	**Mid-Term exam**		**7**	
8	Aliphatic Amines	Definition and classification Nomenclature Physical properties Preparation and reactions	**8**	2
9	Aliphatic Aldehydes and Ketones	Nomenclature and physical properties Some common aldehydes and ketons Synthesis Reactions	**9**	2
10	Aliphatic carboxylic acids & their derivatives	Nomenclature and physical properties Acidity and acidity constants Synthesis Reactions	**10**	2
11	Stereochemistry	Definition and classification Constitutional isomers:- - Chain and cyclic isomers - position isomers - Function groups isomers	**11**	2
12		Stereoisomers c- Configurational isomers:-		

	Stereochemistry	- Enantiomers - Diastereoisomers - Meso isomers	**12**	2
		Designing of configuration (R & S)		
13	Stereochemistry	Stereoisomers	**13**	2
		d- Geometrical isomers - Cis & Trans - Z & E		
14	General Revision	General revision about the above subjects	**14**	2
15	**Final Exam**		**15**	2
Number of Weeks /and Units Per Semester			**15**	**30**

B - Practical Aspect: (if any)

Order	Tasks/ Experiments	Weeks Due	contact hours
1	Introduction and laboratory safety	**1**	**2**
2	Physical Characters and Solubility	**2**	**2**
3	Physical Characters and Solubility	**3**	**2**
4	Chemical reactions	**4**	**2**
5	Application on physical and chemical reactions	**5**	**2**
6	Identification of Alkane, Alkenes and Alkynes	**6**	**2**
7	**Mid-Term exam**	**7**	**2**
8	Identification of Alcohols	**8**	**2**
9	Identification of Aldehydes and Ketones	**9**	**2**
10	Identification of Aliphatic Carboxylic Acids and Salts	**10**	**2**
11	Identification of Aliphatic Carboxylic Acids and Salts	**11**	**2**
12	Identification of Esters and Amides	**12**	**2**
13	General Revision	**13**	**2**
14	**Practical Exam**	**14**	**2**
Number of Weeks /and Units Per Semester		**14**	**28**

VII. Teaching strategies of the course:

- Lecture (material presentation, illustration with examples and discussion.

- Problem analysis and problems' solution.
- Explanation and consulting
- Practical work material, practical problem solution, individual student's work.

VII. Assignments:

No	Assignments	Week Due	Mark
1	**Participation, assignments, problem solving and quizzes**	3-12 w	10

IX. Schedule of Assessment Tasks for Students During the Semester:

Assessment	Type of Assessment Tasks	Week Due	Mark	Proportion of Final Assessment
1	**Participation, assignments, problem solving and quizzes**	**3-12 w**	**10**	**10 %**
2	**Midterm exam**	**7 W**	**10**	**10 %**
3	**Final exam (theoretical)**	**15 W**	**40**	**40 %**
4	**Practical work**	**2-13 W**	**10**	**10 %**
5	**Final exam (practical)**	**14 W**	**30**	**30 %**
6	**Total**		**100**	**100 %**

X. Learning Resources:

	1- Organic Chemistry, A Short Course, Dived J. Hart; Christopher M. Hadad; Leslie E. Crair and Harold Hart. Cengage Learning 2010. **2-** A Microscale Approach to Organic Laboratory Techniques, Donald L. Pavia, Gary M. Lampman, George S. Kriz, Randall G. Engel, 4th Ed., 2016
2- Essential References.	
	1- Organic Chemistry, T. W. Graham Solomons, Craig B. Fryhle, and Scott A. Snyder11th Ed., 2014. 2- Organic Chemistry, Textbook Website; Francis A. Carey; McGraw-Hill, 2001 3- Vogel's Quantitative Chemical Analysis, J. Mendham, R.C. Denney, J. D. Barnes, M.J.K. Thomas, 6th Ed., 2006.
3- Electronic Materials and Web Sites *etc*.	

	1- Power Point Presentation (PPT and /or Pdf) Slides for Lectures Delivery.

XI.Course Policies:	
1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam.
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** - Assignments and projects will be assessed individually unless the teacher request for group work.
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course.
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:**

Course Specification of Physiology (1)

I. Course Identification and General Information:

1	**Course Title:**	**Physiology (1)**				
2	**Course Code & Number:**	**PHA224**				
3	**Credit hours:**	C.H				TOTAL
		Th.	Seminar	practical	Training.	
		2				**2**
4	**Study level/ semester at which this course is offered:**	*Second year , first semester*				
5	**Pre –requisite (if any):**	**Anatomy and Histology**				
6	**Co –requisite (if any):**					
7	**Program (s) in which the course is offered:**	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	**Language of teaching the course:**	**English**				
9	**Study System**	**Semester**				
10	**Mode of delivery:**	**Regular**				
11	**Location of teaching the course:**	**University campus**				
12	**Prepared By:**	**Dr Mansoor al Khulaidi**				

II. Course Description:

This course provides the student with the principles of physiology: homeostasis, control system mechanisms and regulatory feedback systems. The course covers the physiology of following systems: cardiovascular system, Blood, respiratory system, The Nervous System (Neurons and Synapses), Autonomic nervous system.

III. Course Objectives:

1. Students should be able to explain interrelationships among molecular, cellular, tissue and organ functions in each system.
2. Students should be able to understand the physiological anatomy of the heart
3. Students should be able to understand the pulmonary and systemic circulation of the heart.
4. The students should be able to describe mechanisms of neurotransmitters actions for more understanding of drug action in pharmacology.
5. Students should be able to identify functional structures of the respiratory system.

IV. Course Intended learning outcomes (CILOs) of the course		WRITE Symbol and number of PILOs
a.1	Identify the functional organization and structure of each major organ and body system considered within the course and Explain the contributions of organs and systems to the maintenance of homeostasis.	A1
a.2	Explain the physiology of autonomic nervous system, muscular system, the cardiovascular system and the respiratory system.	A3
b.1	Apply the learned physiological information in understanding of pharmacology	B1
b.2	Distinguish a physiological from a pathophysiological condition	B3
c.1	Advice the patients about some important physiological measurements (including blood pressure)	C5
d.1	Cooperate with other students and staff in analysis of medical examination and diagnosis of physiological problems.	D1
d.2	Retrieve information about physiology of different body systems	D3

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1. Identify the functional organization and structure of each major organ and body system considered within the course and Explain the contributions of organs and systems to the maintenance of homeostasis.	Lectures, Watching videos. Group discussion. Seminar	Assignments Written exam Continuous evaluation
a2. Explain the physiology of autonomic nervous system, muscular system, the cardiovascular system and the respiratory system.	Lectures, Watching videos. Group discussion. Seminar	Assignments Written exam Continuous evaluation

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1- Apply the learned physiological information in understanding of pharmacology	Lectures, Group discussion Problem-based learning	Assignments, written exam Problem solving exercises
b2- Distinguish a physiological from a pathophysiological condition.	Lectures, Group discussion Problem-based learning	Assignments, written exam Problem solving exercises

(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1- Advice the patients about some important physiological measurements (including blood pressure).	Lectures, Group discussion Problem-based learning	Problem solving exercises, reports Written exam

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1- Cooperate with other students and staff in analysis of medical examination and diagnosis of physiological problems.	Group discussion Cooperative Learning Seminar	Observation Assignments, reports.
d2- Retrieve information about physiology of different body systems	Self learning Seminar	Presentation, Assignments, reports

V. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	contact hours
1	**Introduction to Physiology**	a.1, b.1	Definitions, Homeostasis of internal environment & feedback: Control systems; Negative feedback loops. Positive feedback control; Neural & endocrine regulation; control of hormone secretion.	1	2
2	**Functions of the plasma membrane**	a.1, b.1, d.1, d.2	Diffusion and osmosis; Regulation of blood osmolality; Carrier-mediated transport; Facilitated diffusion; Active transport; Bulk transport; Membrane Potential; Equilibrium potentials; Resting	1	2

			membrane potential		
3	**The Nervous System (Neurons & Synapses)**	a.1, b.1, b.2, d.1, d.2	Neurons & supporting cells; Electrical activity in axons; Ion gating in axons; Action potentials; All or none law; Refractory Periods; Conduction of nerve impulses in myelinated and unmyelinated axons; Synapse; Electrical & chemical synapses;	1	2
4	**The Nervous System** (neurotransmitters)	a.1, a.2, b.1, b.2, d.1, d.2	Action of neurotransmitter; Acetylcholine; Chemically regulated channels; Ligand operating channels; G-Protein-operating channels; Acetylcholinesterase.	1	2
5	**The Autonomic Nervous System-1**	a.1, a.2, b.1, b.2, d.1, d.2	Neural control of involuntary effectors; Autonomic neurons; Divisions of the Autonomic nervous system; Sympathetic division; Collateral ganglia; Adrenal glands; Parasympathetic division	1	2
6	**The Autonomic Nervous System-2**	a.1, a.2, b.1, b.2, d.1, d.2	Functions of the Autonomic nervous system; Adrenergic & cholinergic transmission; Responses to adrenergic stimulation; Responses to cholinergic stimulation; Organs with dual innervation	1	2

			(examples).		
7	Midterm exam	a.1, a.2, b.1, b.2, d.1		1	2
8	**Heart & Circulation-1**	a.1, b.1, b.2, c.1, d.1, d.2	Functions of the circulatory system; Major components of the circulatory system; Composition of the blood; Plasma;	1	2
9	**Heart & Circulation-2**	a.1, a.2, b.1, b.2, c.1, d.1, d.2	Formed elements of blood; Erythrocytes; Leukocytes; Platelets; Hematopoiesis; Regulation of Ervthropoiesis	1	2
10	**Heart & Circulation-3**	a.1,a.2, b.1, b.2, c.1, d.1, d.2	Red blood cell antigens and blood typing; ABO system; Transfusion reaction; Rh Factor; Blood clotting; Platelets and blood vessel walls; Clotting factors : formation of fibrin; Dissolution of clots; Anticoagulants.	1	2
11	**Heart & Circulation-4**	a.1, a2, b.1, b.2, c.1, d.1, d.2	Structure of the heart: Pulmonary & systemic circulation; Atrioventricular & semilunar valves; Cardiac cycle & heart sounds; Pressure changes during cardiac cycle; Heart sounds; Heart murmurs;	1	2
12	**Heart & Circulation-5**	a.1, a.2, a.4, b.1, b.2, d.1, d.2	Electrical activity of the heart & the ECG; Myocardial action potential; Conduction tissues of the heart**;** Conduct ion of the impulse**;** Excitation-contraction coupling in heart muscle; ECG;	1	2
13	**Heart &**	a.1,a.2, b.1, b.2, c.1, d.1, d.2	Cardiac output;	1	

	Circulation-6		Regulation of cardiac rate; Regulation of stroke volume; Frank-Starling Law of the heart; Intrinsic control of contraction; Extrinsic control of contractility; Venous return; Blood volume; Regulation of blood volume by the kidneys; Regulation by ADH hormone; Regulation by aldosterone; Renin-anglolensin-aldoslerone system; Atrial natriuretlc peptide; Vascular Resistance to blood flow;		2
14	**Heart & Circulation-7**	a.1-a.2, b.1, b.2, c.1, d.1, d.2	Extrinsic regulation of blood flow; Regulation by sympathetic nerves; Parasympathetic control of blood flow; Paracrine regulation of blood flow; Intrinsic regulation of blood flow; Myogenic control mechanisms; Metabolic control mechanisms; Blood Pressure; Baroreceptor reflex; Atrial stretch reflexes; Measurement of blood pressure; Pulse pressure & mean arterial pressure	1	2
15	**Respiratory System**	a.1, a.2, b.1, b.2, c.1, d.1, d.2	Structure of respiratory system; Physical aspects of ventilation; Intrapulmonary & intrapleural pressures; Boyle's law; Physical properties of the lungs;	1	2

			Compliance; Elasticity; Surface tension; Surfactant & the respiratory distress syndrome; Mechanics of breathing		
16	**Final examination**	a.1, a.2, b.1, b.2, c.1, d.1		1	2
Number of Weeks /and Units Per Semester				**16**	**32**

VI. Teaching strategies of the course:

Lectures, Watching videos, Group discussion.
Seminar
Problem-based learning
Cooperative Learning
Self learning

VII. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Home works assignments	a.1, a.2, b.1, b.2, c.1, d.1, d.2	Continually	5
2				

VIII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Home works assignments	Continually	5	5%	a.1, a.2, b.1, b.2, c.1, d.1, d.2
2	Class Activities	Continually	5	5%	a.1, a.2, b.1, b.2
4	Mid-term exam	7th week	20	20%	a.1, a.2, b.1, b.2, d.1
5	Final exam	16th week	70	70 %	a.1, a.2, b.1, b.2, c.1, d.1
6	**Total**		**100**	**100%**	

IX. Learning Resources:

1- Required Textbook(s) (maximum two).

- Stuart Ira Fox. 2016. Human Physiology, 14th edition, McGraw Hill.
- Marieb E.N. (2015). Essentials of Human Anatomy and physiology, 11th edition, Pearson Education, Inc.

2- Essential References.

1- Gerard J. Tortora and Bryan H. Derrickson (2012). Principles of Anatomy and Physiology, 13th edition, Wiley and Sons, Inc.
2- Guyton and Hall Textbook of Medical Physiology, 13th Edition (Guyton Physiology), John E. Hall. 2012
3- Ganong's Review of Medical Physiology, 24th Edition (LANGE Basic Science) 24th Edition by Kim E. Barrett, Susan M. Barman, Scott Boitano, Heddwen Brooks

3- Electronic Materials and Web Sites *etc.*

1- https://www.udemy.com/course/physiology/
2- https://www.physiologyweb.com/
3- https://www.physiology.org/

X.Course Policies:

1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** - Assignments and projects will be assessed individually unless the teacher request for group work
5	**Cheating:**

	- Cheating by any means will cause the student failure and he/she must re-study the course
6	**Plagiarism:** Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the faculty rules.
7	**Other policies**:

Template for Course Plan (Syllabus) Physiology (1)

I. - Information about Faculty Member Responsible for the Course:

		Office Hours					
Name of Faculty Member							
Location& Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Identification and General Information:

1	Course Title:	Physiology (1)				
2	Course Number & Code:	PHA224				
3	Credit hours:	C.H				Total
		Th.	Seminar	Pr.	F. Tr.	
		2				2
4	Study level/year at which this course is offered:	*Second year , first semester*				
5	Pre –requisite (if any):	Anatomy and Histology				
6	Co –requisite (if any):					
7	Program (s) in which the course is offered	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	Language of teaching the course:	English				
9	System of Study:	Semester				
10	Mode of delivery:	Regular				
11	Location of teaching the course:	University campus				

III. Course Description:

This course provides the student with the principles of physiology: homeostasis, control system mechanisms and regulatory feedback systems. The course covers the physiology of following systems: cardiovascular system, Blood, respiratory system, The Nervous System (Neurons and Synapses), Autonomic nervous system.

IV. Course Objectives:

1- Students should be able to explain interrelationships among molecular, cellular, tissue and organ functions in each system.
2- Students should be able to understand the physiological anatomy of the heart
3- Students should be able to understand the pulmonary and systemic circulation of the heart.
4- The students should be able to describe mechanisms of neurotransmitters actions for more understanding of drug action in pharmacology.
5- Students should be able to identify functional structures of the respiratory system.

V. Intended learning outcomes (ILOs) of the course:

Brief summary of the knowledge or skill the course is intended to develop:

1- Identify the functional organization and structure of each major organ and body system considered within the course and Explain the contributions of organs and systems to the maintenance of homeostasis.
2- Explain the physiology of autonomic nervous system, muscular system, the cardiovascular system and the respiratory system.
3- Discuss the significance of blood circulation and other tissue fluids and explain the properties and function of blood.
4- Describe the mechanisms regulating cardiac output, heart rate and arterial blood pressure and the mechanisms of transport across cell membrane and mechanisms of neurotransmitters actions for more understanding of drug action in pharmacology.
5- Apply the learned physiological information in understanding of pharmacology.
6- Distinguish a physiological from a pathophysiological condition.
7- Advice the patients about some important physiological measurements (including blood pressure).
8- Cooperate with other students and staff in analysis of medical examination and diagnosis of physiological problems.
9- Retrieve information about physiology of different body systems.

VI. Course Content:

- Distribution of Semester Weekly Plan of Course Topics/Items and Activities.

A – Theoretical Aspect:

Order	Topics List	Week Due	Contact Hours
1	**Introduction to Physiology:** Definitions, Homeostasis of internal environment & feedback: Control systems; Negative feedback loops. Positive feedback control; Neural & endocrine regulation; control of hormone secretion.	W1	2
2	**Functions of the plasma membrane:** Diffusion and osmosis; Regulation of blood osmolality; Carrier-mediated transport; Facilitated diffusion; Active transport; Bulk transport; Membrane Potential; Equilibrium potentials; Resting membrane potential	W2	2

3	**The Nervous System (Neurons & Synapses):** Neurons & supporting cells; Electrical activity in axons; Ion gating in axons; Action potentials; All or none law; Refractory Periods; Conduction of nerve impulses in myelinated and unmyelinated axons; Synapse; Electrical & chemical synapses.	W3	2
4	**The Nervous System (neurotransmitter):** Action of neurotransmitter; Acetylcholine; Chemically regulated channels; Ligand operating channels; G-Protein-operating channels; Acetylcholinesterase	W4	2
5	**The Autonomic Nervous System-1:** Neural control of involuntary effectors; Autonomic neurons; Divisions of the Autonomic nervous system; Sympathetic division; Collateral ganglia; Adrenal glands; Parasympathetic division	W5	2
6	**The Autonomic Nervous System-2:** Functions of the Autonomic nervous system; Adrenergic & cholinergic transmission; Responses to adrenergic stimulation; Responses to cholinergic stimulation; Organs with dual innervation (examples).	W6	2
7	**Midterm exam**	W7	2
8	**Heart & Circulation-1**: Functions of the circulatory system; Major components of the circulatory system; Composition of the blood; Plasma;	W8	2
9	**Heart & Circulation-2:** Formed elements of blood; Erythrocytes; Leukocytes; Platelets; Hematopoiesis; Regulation of Ervthropoiesis	W9	2
10	**Heart & Circulation-3:** Red blood cell antigens and blood typing; ABO system; Transfusion reaction; Rh Factor; Blood clotting; Platelets and blood vessel walls; Clotting factors : formation of fibrin; Dissolution of clots; Anticoagulants.	W10	2
11	**Heart & Circulation-4:** Structure of the heart: Pulmonary & systemic circulation; Atrioventricular & semilunar valves; Cardiac cycle & heart sounds; Pressure changes during cardiac cycle; Heart sounds; Heart murmurs;	W11	2
12	**Heart & Circulation-5:** Electrical activity of the heart & the ECG; Myocardial action potential; Conduction tissues of the heart**;** Conduct ion of the impulse**;** Excitation-contraction coupling in heart muscle; ECG;	W12	2
13	**Heart & Circulation-6:** Cardiac output; Regulation of cardiac rate; Regulation of stroke volume; Frank-Starling Law of the heart; Intrinsic control of contraction; Extrinsic control of contractility; Venous return; Blood volume;	W13	2

	Regulation of blood volume by the kidneys; Regulation by ADH hormone; Regulation by aldosterone; Renin-anglolensin-aldoslerone system; Atrial natriuretlc peptide; Vascular Resistance to blood flow;		
14	**Heart & Circulation-7:** Extrinsic regulation of blood flow; Regulation by sympathetic nerves; Parasympathetic control of blood flow; Paracrine regulation of blood flow; Intrinsic regulation of blood flow; Myogenic control mechanisms; Metabolic control mechanisms; Blood Pressure; Baroreceptor reflex; Atrial stretch reflexes; Measurement of blood pressure; Pulse pressure & mean arterial pressure	W14	2
15	**Respiratory System:** Structure of respiratory system; Physical aspects of ventilation; Intrapulmonary & intrapleural pressures; Boyle's law; Physical properties of the lungs; Compliance; Elasticity; Surface tension; Surfactant & the respiratory distress syndrome; Mechanics of breathing	W15	2
16	**Final examination**	W16	2
Number of Weeks /and Units Per Semester		**16**	**32**

VII. Teaching strategies of the course:

Lectures, Watching videos, Group discussion.

Seminar

Problem-based learning

Cooperative Learning

Self learning

VIII. Assignments:

No	Assignments	Week Due	Mark
1	Home works assignments	Continually	5

IX. Schedule of Assessment Tasks for Students During the Semester:

Assessment	Type of Assessment Tasks	Week Due	Mark	Proportion of Final Assessment
1	Home works assignments	Continually	5	5%

2	Class Activities	Continually	5	5%
3	Mid-term exam	7th week	20	20%
4	Final exam	16th week	70	70 %
5	TOTAL		100	**100%**

X. Learning Resources:

1- Required Textbook(s) (maximum two).

1- Stuart Ira Fox. 2016. Human Physiology, 14th edition, McGraw Hill.
2- Marieb E.N. (2015). Essentials of Human Anatomy and physiology, 11th edition, Pearson Education, Inc.

2- Essential References.

1- Gerard J. Tortora and Bryan H. Derrickson (2012). Principles of Anatomy and Physiology, 13th edition, Wiley and Sons, Inc.
2-Guyton and Hall Textbook of Medical Physiology, 13th Edition (Guyton Physiology), John E. Hall. 2012
3-Ganong's Review of Medical Physiology, 24th Edition (LANGE Basic Science) 24th Edition by Kim E. Barrett, Susan M. Barman, Scott Boitano, Heddwen Brooks

3- Electronic Materials and Web Sites *etc*.

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XI.Course Policies:

1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam.
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** - Assignments and projects will be assessed individually unless the teacher request for group work.
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course.
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the faculty rules.

7	**Other policies:**

Course Specification of Biochemistry (1)

I. Course Identification and General Information:

1	**Course Title:**	**Biochemistry (1)**				
2	**Course Code & Number:**	**PHA241**				
3	**Credit hours:**	C.H				TOTAL
		Th.	Seminar	practical	Training.	
		2	**0**		**0**	***2***
4	**Study level/ semester at which this course is offered:**	**Second Year- 1st semester**				
5	**Pre –requisite (if any):**	**General chemistry**				
6	**Co –requisite (if any):**	**Organic chemistry**				
7	**Program (s) in which the course is offered:**	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	**Language of teaching the course:**	English				
9	**Study System**	**Semester**				
10	**Mode of delivery:**	Regular				
11	**Location of teaching the course:**	**Al-Saeed University**				
12	**Prepared By:**	Assoc. Prof. **Mufeed A. Baddah**				

II. Course Description:

The course is intended to teach pharmacy students the basics of biochemsitry. The course will cover the following topics: Carbohydrates chemistry, Amino acids & protein chemistry, Lipid chemistry, Non-protein nitrogenous compounds, Enzymes, Vitamins, Nucleic acid chemistry, Oxidative phosphorylation. The course also includes some basic biochemical laboratory experiments to study the physical and chemical properties of different biomolecules and the enzyme activity. Furthermore, the information presented in this course will prepare the student for Biochemistry II course.

III. Course Objectives:

Upon successful completion of the course, the students will be able to:

1. Understand the basic principles of biochemistry & their importance for living organisms.
2. Describe the structures and functions of different biomolecules including carbohydrates, lipids, amino acids, proteins and nucleic acids.
3. Describe the structure and biochemical importance of vitamins as well as the actions, functions and kinetics and applications of enzymes.
4. Understand the concept of oxidative phosphorylation and energy production.

IV.	Course Intended learning outcomes (CILOs) of the course	WRITE Symbol and number of PILOs
a.1	Describe the structure and function of carbohydrates, lipids, amino acids, proteins, nucleotides, nucleic acids, enzymes and vitamins.	**A1**
a.2	Identify the concept of oxidative phosphorylation and energy production and other important biochemical reactions.	**A2,A3**
b.1	Interpret symptoms, signs and biochemical laboratory findings of some vitamin deficiency disease.	B1
b.2	Determine the appropriate methods for identification of different biochemical compounds in biological fluids**.**	**B3**
d.1	Interact and communicate effectively and ethically with teaching staff during the learning process.	**D1**
d.2	Work effectively using modern technology resources as a group in laboratory and in researches.	**D3**

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1- Describe the structure and function of carbohydrates, lipids, amino acids, proteins, nucleotides, nucleic acids, enzymes and vitamins.	- Lecture - Discussion - Self-learning - Seminars	- Written exam - Assignments - Continuous evaluation
a2- Identify the concept of oxidative phosphorylation and energy production and other important biochemical reactions.		

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1- Interpret symptoms, signs and biochemical laboratory findings of some vitamin deficiency disease.	- Lecture - Discussion - Case studies - Practical classes	- Written and Practical exams - Assignments - Continuous evaluation - Case studies
b2- Determine the appropriate methods for identification of different biochemical compounds in biological fluids**.**		

(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1- Interact and communicate effectively and ethically with teaching staff during the learning process.	- Discussion - Practical classes - Seminar	- Oral presentation - Observation - Assignments, Report
d2- Work effectively using modern technology resources as a group in laboratory and in researches.		

V. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	contact hours
1	Carbohydrates:	a.1, b.1, d1	-Introduction of carbohydrates -Monosaccharide and disaccharides chemistry and their derivatives -Homo-Polysaccharides chemistry - Hetero-Polysaccharides chemistry	2	4
2	Proteins:	a.1, b.1, d1,d2	-Introduction of Protein chemistry and function -Individual amino acids structure -Protein structure -Oligopeptides compounds (glutathione, vasopressin, oxytocin(Myoglobin and hemoglobin	2	4
3	Lipid chemistry:	a.1, b.1, d1-d2	-Different classes of lipid: Neutral fats and phospholipids - Lipoproteins, Cholesterol and ergosterol	2	4
4	Mid-Term Exam	a.1, b.1-b2, d1		1	2
5		a.1, b.1, d1, d2	Non-protein nitrogenous compounds	1	2
6	Enzymes:	a.2, b.1, d1, d2	Classifications, mode of actions, kinetics, Inhibitors,	2	4

			regulation of enzyme activity and role in clinical diagnosis		
7	Vitamins:	a.1, b.1-b.2, d1-d2	-Water-soluble vitamins -Lipid-soluble vitamins	2	4
8	Nucleic acid chemistry:	a.1, b.1, d1-d2	-Nitrogenous bases -Nucleoside -Nucleotides -DNA structure -RNA structure types - Post-transcriptional modifications	2	4
9	Oxidative phosphorylation	a.2, b.1, d1-d2	Oxidative phosphorylation	1	2
10	**Final Term exam**	a.1-a.2, b.1-b.2, d1		1	2
			Number of Weeks /and Units Per Semester	**16**	**32**

VI. Teaching strategies of the course:

- Lecture
- Discussion
- Self-learning
- Seminars
- Case studies

VII. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Homework Assignments	a.1-a.2, b.1-b.2, d1-d2	4-12	5
	Total			5

VIII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
2	Homework Assignments	4-12	10	10%	a.1-a.2, b.1-b.2, d1-d2

4	Mid-term theoretical Exam	7	10	20%	a.1, b.1-b.2, d1
6	Final theoretical Exam	16	70	70%	a.1-a., b.1-b.2, d1-
7	Total		100	100%	

IX. Learning Resources:

1- Required Textbook(s) (maximum two).

1- Pamela C. Champe, Richard A. Harvey, Denise R. Ferrier. 2016. Lippincott's Illustrated Reviews: Biochemistry. 7th edition. Lippincotts Williams & Willkins.
2- Robert K. Murray, Daryl K. Granner, Peter A. Mayes, Victor W. Rodwell. 2016. Harper's illustrated Biochemistry. 30th edition. McGraw-Hill.

2- Essential References.

1- David L. Nelson and Michael M, (2012), Lehninger Principles of Biochemistry, Cox. 6th edition, W.H. Freeman.
2- Devlin T. M, (2010), Textbook of Biochemistry with Clinical Correlations, 7th edition, New York,

3- Electronic Materials and Web Sites *etc.*

1. Periodical Book Website
2. http://www.kumc.edu/biochemistry/resource.htm
3. http://www.medlib.iupui.edu/ref/biochem.htm

4- Other Learning Material:

Hand out (if possible) prepared by the lecturer.

X. Course Policies:

1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2	**Tardy:** - Any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** - Assignments and projects will be assessed individually unless the teacher request for group work
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the faculty rules.

Template for Course Plan (Syllabus) Biochemistry (1)

I. Information about Faculty Member Responsible for the Course:

		Office Hours					
Name of Faculty Member							
Location& Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Identification and General Information:

1	Course Title:	Biochemistry (1)				
2	Course Code & Number:	PHA241				
3	Credit hours:	C.H				TOTAL
		Th.	Seminar	practical	Training.	
		2	0		0	2
4	Study level/ semester at which this course is offered:	Second Year- 1st semester				
5	Pre –requisite (if any):	General chemistry				
6	Co –requisite (if any):	Organic chemistry				
7	Program (s) in which the course is offered:	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	Language of teaching the course:	English				
9	Study System	Semester				
10	Mode of delivery:	Regular				
11	Location of teaching the course:	Al-Saeed University				

III. Course Description:

The course is intended to teach pharmacy students the basics of biochemsitry. The course will cover the following topics: Carbohydrates chemistry, Amino acids & protein chemistry, Lipid chemistry, Non-protein nitrogenous compounds, Enzymes, Vitamins, Nucleic acid chemistry, Oxidative phosphorylation. The course also includes some basic biochemical laboratory experiments to study the physical and chemical properties of different biomolecules and the enzyme activity. Furthermore, the information presented in this course will prepare the student for Biochemistry II course.

IV. Course Objectives:

Upon successful completion of the course, the students will be able to:

1- Understand the basic principles of biochemistry & their importance for living organisms.

2- Describe the structures and functions of different biomolecules including carbohydrates, lipids, amino acids, proteins and nucleic acids.

3- Describe the structure and biochemical importance of vitamins as well as the actions, functions and kinetics and applications of enzymes.

4- Understand the concept of oxidative phosphorylation and energy production.

V. Intended learning outcomes (ILOs) of the course:

Brief summary of the knowledge or skill the course is intended to develop:
Describe the structure and function of carbohydrates, lipids, amino acids, proteins, nucleotides, nucleic acids, enzymes and vitamins.
Identify the concept of oxidative phosphorylation and energy production and other important biochemical reactions.
Interpret symptoms, signs and biochemical laboratory findings of some vitamin deficiency disease.
Determine the appropriate methods for identification of different biochemical compounds in biological fluids.
Use effectively the laboratory glass-wares and instruments that are used for determination of the different biochemical compounds in the biological fluids.
Carry out laboratory tests and apply the suitable methods for identification and studying the properties of different biochemical compounds.
Interact and communicate effectively and ethically with teaching staff during the learning process.
Work effectively using modern technology resources as a group in laboratory and in researches.

VI. Course Content:

- Distribution of Semester Weekly Plan of Course Topics/Items and Activities.

A – Theoretical Aspect:

Order	Topics List	Week Due	Contact Hours
1	**Carbohydrates:** - Introduction of carbohydrates -Monosaccharide and disaccharides chemistry and their derivatives -Homo-Polysaccharides chemistry - Hetero-Polysaccharides chemistry	W1, W2	4

2	**Proteins:** - Introduction of Protein chemistry and function -Individual amino acids structure -Protein structure -Oligopeptides compounds (glutathione, vasopressin, oxytocin(Myoglobin and hemoglobin	W3, W4	4
3	**Lipid chemistry:** - Different classes of lipid: Neutral fats and phospholipids - Lipoproteins, Cholesterol and ergosterol	W5, W6	4
4	**Midterm exam**	W7	2
5	**Non-protein nitrogenous compounds**	W8	2
6	**Enzymes:** Classifications, mode of actions, kinetics, Inhibitors, regulation of enzyme activity and role in clinical diagnosis.	W9, W10	4
7	**Vitamins:** - Water-soluble vitamins -Lipid-soluble vitamins	W11, W12	4
8	**Nucleic acid chemistry:** - Nitrogenous bases -Nucleoside -Nucleotides -DNA structure -RNA structure types - Post-transcriptional modifications	W13, W14	4
9	**Oxidative phosphorylation**	W15	2
10	Final exam	W16	2
Number of Weeks /and Units Per Semester		**16**	**32**

VII. Teaching strategies of the course:

- Lecture and Discussion
- Self-learning
- Seminars
- Case studies
- Practical classes

VIII. Assignments:

No	Assignments	Week Due	Mark
1	Homework assignments	4-12	5
	Total		5

IX. Schedule of Assessment Tasks for Students During the Semester:

Assessment	Type of Assessment Tasks	Week Due	Mark	Proportion of Final Assessment
2	Homework assignments	4-12	10	10%
4	Mid-term theoretical Exam	7	20	20%
6	Final theoretical Exam	16	70	70%
7	Total	100	100%	

X. Learning Resources:

1- Required Textbook(s) (maximum two).

1- Pamela C. Champe, Richard A. Harvey, Denise R. Ferrier. 2016. Lippincott's Illustrated Reviews: Biochemistry. 7th edition. Lippincotts Williams & Willkins.

2- Robert K. Murray, Daryl K. Granner, Peter A. Mayes, Victor W. Rodwell. 2016. Harper's illustrated Biochemistry. 30th edition. McGraw-Hill.

2- Essential References.

1- David L. Nelson and Michael M, (2012), Lehninger Principles of Biochemistry, Cox. 6th edition, W.H. Freeman.

2- Devlin T. M, (2010), Textbook of Biochemistry with Clinical Correlations, 7th edition, New York,

3- Electronic Materials and Web Sites *etc.*

4. Periodical Book Website
5. http://www.kumc.edu/biochemistry/resource.htm
6. http://www.medlib.iupui.edu/ref/biochem.htm

4- Other Learning Material:

Hand out (if possible) prepared by the lecturer.

XI. Course Policies:

1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will

	not be allowed to attend the final exam
2	**Tardy:** - Any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** - Assignments and projects will be assessed individually unless the teacher request for group work
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:** -

Course Specification of Pharmaceutics (1)

I. Course Identification and General Information:

1	**Course Title:**	Pharmaceutics (1)				
2	**Course Code & Number:**	**PHA252**				
3	**Credit hours:**	C.H				TOTAL
		Th.	Seminar	practical	Training.	
		2		**1**		**2**
4	**Study level/ semester at which this course is offered:**	2nd year / 1st semester				
5	**Pre –requisite (if any):**	Pharmaceutical Calculations, physical pharmacy				
6	**Co –requisite (if any):**	**None**				
7	**Program (s) in which the course is offered:**	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	**Language of teaching the course:**	**English**				
9	**Study System**	**Semester**				
10	**Mode of delivery:**	**Regular**				
11	**Location of teaching the course:**	**Al-Saeed University campus**				
12	**Prepared By:**	**Dr. Abdulkarim Kassem Alzomor**				

II. Course Description:

The first topics in this course provides an introduction to the science and art of pharmaceutical dosage form design in particular knowledge in roles and types of excipients and also in the subsequent stages of design including preformulation, formulation and development. Then, the second topics of this course provides essential knowledge and skills for preparation of liquid dosage forms. The students will also apply knowledge in performing some basic laboratory experiments.

III. Course Objectives:

The course aims to

1- Understand the role of formulation design and additives in maintaining the stability of the dosage forms and the bioavailability of drug.
2- Know the different types of liquid dosage form, advantage disadvantage, design and different excipients used.

IV.	Course Intended learning outcomes (CILOs) of the course	WRITE Symbol and number o PILOs
a.1	Describe the role of pharmacist in formulation and the stages of designing a pharmaceutical dosage form.	**A2**
a.2	Explicit the general properties, the types and roles of excipients, advantages and disadvantages of pharmaceutical liquid dosage forms.	**A2**
b.1	Classify pharmaceutical dosage forms and categorize liquid dosage forms**.**	**B2, B3**
b.2	Design liquid pharmaceutical dosage forms.	**B2, B3, B4**
d.1	Communicate effectively and behave in discipline with colleagues.	**D1**
d.2	Participate efficiently with colleagues in a team work	**D1**

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1- Describe the role of pharmacist in formulation and the stages of designing a pharmaceutical dosage form.	- Lectures and Groups discussion. - Practical presentations - Self - learning.	Quizzes, Written exam.
a2. Explicit the general properties, the types and roles of excipients, advantages and disadvantages of pharmaceutical liquid dosage forms		

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1. Classify pharmaceutical dosage forms and categorize liquid dosage forms**.**	- Discussions and Training - Field visits - Problem solving - Practical classes	- Quizzes, Homework - Observation - Task's Evaluates
b2. Design liquid pharmaceutical dosage forms.		

(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1. Handle efficiently and safely the chemical materials and tools used in the laboratory.	- Discussions and Training - Field visits - Problem solving - Practical classes	- Quizzes, Homework - Observation - Task's Evaluates
c2. Operate the instruments and prepare		

safe and effective liquid extemporaneous pharmaceutical dosage forms.		

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1. Communicate effectively and behave in discipline with colleagues. d2. Participate efficiently with colleagues in a team work.	- Group discussions - Cooperative learning. - Self – learning - Inductive and deductive	- Homework - Evaluates of Oral Presentation

V. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	contact hours
1	**Introduction To pharmaceutics**	a1, a2, b1, b2	Definitions and brief history of pharmaceutics, pharmacopeia, Definition of dosage form, the components, the need to dosage forms, classification of dosage forms	1	2
2	**Pharmaceutical excipients**	a1, a2, b1,d2	Roles, types with examples • **Essential:** solvents, vehicles, emulsifying agents, binders, etc. • **Organoleptic** excipients: colorants, sweeteners, flavors • **Stabilizers:** buffers, preservatives, antioxidants, anti-cake, etc. • **Bioavailability enhancers** • **Excipients for other purposes**	1	2
3	**Design of dosage form: Preformulation, Formulation and development**	a1, a2, , b1, b2,d1	• **Preformulation stage:** physicochemical properties and analytical data required. Scheme of preformulation, Compatibility testing. • **Formulation:** general rules, sources of raw materials, economic impact • **Development** stage	2	4

4	**Old pharmaceutical dosage forms**	a1, a2, b1, b2, d1	Definition; disadvantages of Galenicals, lozenges, cachets, pills, etc.	1	2
5	**Introduction to Non-sterile Pharmaceutical solutions**	a1, a2, b1, b2, d2	Definition of solutions, types, advantages, disadvantages, general method of preparation, enhancement of dissolution, excipients, types of waters	1	2
6	**Aqueous Pharmaceutical solutions (1)**	a1, a2, b1, b2, d2	Definition, General characters, advantages, disadvantages, method of preparation, formulations and excipients with examples of **Topical**: (aqueous Tinctures, Douches/washes, Enema, mouthwashes/gargle, nasal solutions, otic aqueous solutions)	1	2
7	Mid-term Exam			1	2
8	**Aqueous Pharmaceutical solutions (2)**	a1, a2, b1, b2, d1	Definition, General characters, advantages, disadvantages, method of preparation, formulations and excipients with examples of **Oral:** Syrups, linctus's, Elixirs , other oral solutions. **Adjuvant:** Aromatic waters, mucilage	2	4
9	**Non-Aqueous Pharmaceutical solutions**	a1, a2, b1, b2, d1	Definition, General characters, advantages, disadvantages, method of preparation, formulations and excipients with examples of **Topical :** Alcoholic Tinctures, Collodions, liniments, Glycerites (otic glycerite) **Oral:** oleovitamins **Adjuvant:** Spirit	1	2
10	**Non-sterile liquid Dispersion systems (1)**	a1, a2, b1, b2, d1	• **Introduction** Definition, types: coarse dispersion, fine dispersion; compare disperse system and true solution; compare colloids, suspensions, emulsions; general advantages and problems of disperse systems	2	

			• **Coarse dispersions** ➢ **Suspensions** ○ Definition, types, advantages, disadvantages, ideal properties ○ Formulation: (flocculated, deflocculated), excipients (suspending agents, flocculating agents; others) ○ Steps of preparation ○ Instability Problems: sedimentation; cake formation; evaluation and approaches to reduce ○ Packaging		4
11	**Non-sterile liquid Dispersion systems (2)**	a1, a2, b1, b2, d2	➢ **Emulsions** ○ Definition, types, advantages, disadvantages ○ Formulation: excipients (Emulsifying agents; types and selection; HLB) ○ Methods of preparation: wet method, dry ○ method, bottle method ○ Self-emulsified emulsions ○ Instability problems: coalescence, braking, creaming, phase inversion; causes and how to reduce • **Fine dispersions** Definition, types, advantages, disadvantages, principles and method of preparations ➢ **Colloidal suspensions** • **Microemulsions and nanoemulsion:**	2	4
12	FINAL - EXAM			1	2
Number of Weeks /and Units Per Semester				**16**	**32**

B - Practical Aspect:

Order	Tasks/ Experiments	Number of Weeks	contact hours	Aligned Couse Intended Learning Outcomes CILOs
	Aqueous solutions			
1.	Iodine tincture	**1**	**2**	b1, c1,c2, d1, d2,

2.	vaginal douches (sodium borate solution)	1	2	b1, c1,c2, d1, d2,
3.	simple syrup (BP; USP)	1	2	b1, c1,c2, d1, d2,
4.	Peppermint aromatic water	1	2	b1, c1,c2, d1, d2,
5.	Oral rehydration solution	1	2	b1, c1,c2, d1, d2,
6.	Preparation of elixir (paracetamol elixir)	1	2	b1, c1,c2, d1, d2,
7.	Preparation of mouth wash	1	2	b1, c1,c2, d1, d2,
Non-aqueous solutions				
8.	Peppermint spirit	1	2	b1, c1,c2, d1, d2,
9.	camphor liniment	1	2	b1, c1,c2, d1, d2,
10.	Otic glycerite	1	2	b1, c1,c2, d1, d2,
Liquid disperse systems				
11.	calamine lotion (suspension)	1	2	b1, c1,c2, d1, d2,
12.	Preparation of paracetamol (suspension)	1	2	b1, c1,c2, d1, d2,
13.	emulsions (castor oil emulsion)	1	2	b1, c1,c2, d1, d2,
14	**PRACTICAL EXAM**	1	2	b1, c1,c2, d1, d2,
Number of Weeks /and Units Per Semester		**14**	**28**	

VI. Teaching strategies of the course:

- Lectures and Groups discussion.
- Practical presentations
- Self - learning.
- Discussions and Training
- Field visits
- Problem solving
- Practical classes
- Cooperative learning.
- Inductive and deductive

VII. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Class attendance and participation	**a1, a2, b1, b2, c1,c2 d1, d2**	weekly	5
2	Homework, presentation	**a1, a2, b1, b2, c1,c2 d1.**	11	5

VIII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method		Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Assignments		1-14	10	**10%**	**a1,b1,b2,c1, a2, d1,d2**
3	Mid-semester exam of theoretical part (written exam		**8**	**10**	**10%**	**a1,a2,b1,c1, d1,d2**
5	Lab. Term works	Attitude, report	1-12	10	**10%**	**c1, c2,d1,d2**
6		Accomplishments				
7	Final exam (practical)		14	30	30%	**c1, c2,d1,d2**
8	Final exam of theoretical part (written exam)		16	40	40%	**a1,a2,b1,b2,c1, d1,d2**
Total				100	100%	

IX. Learning Resources

1- Required Textbook(s) (maximum two).

1- Aulton M.E., Pharmaceutics: the science of dosage form design, 4th edition, 2010, Churchill Livingstone, UK
2- Ansel`s Pharmaceutical dosage forms and drug delivery system, 2011, Lippincott Williams and Wilkins, USA.

2- Essential References.

1. Williams and Wilkins (2005). Remington; the Science and Practice of Pharmacy (2first edition). Publisher: Lippincott.
2. Herbert A. Lieberman, Martin M. Reiger, GeilbertS.Banker Pharmaceutical Dosage Forms, Vol. 3 (Pharmaceutical Dosage Forms-Disperse), Third Edition, 2010.

3- Electronic Materials and Web Sites *etc*.

www.pubmed.com

X. Course Policies:

1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be

	allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects**: - Assignments and projects will be assessed individually unless the teacher request for group work
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the faculty rules.
7	**Other policies**:

Template for Course Plan (Syllabus) of Pharmaceutics (1)

I. Information about Faculty Member Responsible for the Course:

		Office Hours					
Name of Faculty Member							
Location& Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Identification and General Information:

1	Course Title:	Pharmaceutics (1)				
2	Course Code & Number:	PHA252				
3	Credit hours:	C.H				TOTAL
		Th.	Seminar	practical	Training.	
		2		1		3
4	Study level/ semester at which this course is offered:	2nd year / 1st semester				
5	Pre –requisite (if any):	Pharmaceutical Calculations , Physical Pharmacy				
6	Co –requisite (if any):	None				
7	Program (s) in which the course is offered:	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	Language of teaching the course:	English				
9	Study System	Semester				
10	Mode of delivery:	Regular				
11	Location of teaching the course:	Al-Saeed University campus				

III. Course Description:

The first topics in this course provides an introduction to the science and art of pharmaceutical dosage form design in particular knowledge in roles and types of excipients and also in the subsequent stages of design including preformulation, formulation and development. Then, the second topics of this course provides essential knowledge and skills for preparation of liquid dosage forms. The students will also apply knowledge in performing some basic laboratory experiments.

IV. Course Objectives:

The course aim to

1. Understand the role of formulation design and additives in maintaining the stability of the dosage forms and the bioavailability of drug.
2. Know the different types of liquid dosage form, advantage disadvantage, design and different excipients used.

V. Intended learning outcomes (ILOs) of the course:

1- Describe the role of pharmacist in formulation and the stages of designing a pharmaceutical dosage form.
2- Explicit the general properties, the types and roles of excipients, advantages and disadvantages of pharmaceutical liquid dosage forms.
3- Classify pharmaceutical dosage forms and categorize liquid dosage forms.
4- Design liquid pharmaceutical dosage forms.
5- Handle efficiently and safely the chemical materials and tools used in the laboratory.
6- Operate the instruments and prepare safe and effective liquid extemporaneous pharmaceutical dosa forms.
7- Communicate effectively and behave in discipline with colleagues.
8- Participate efficiently with colleagues in a team wor.

VI. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Sub Topics List	Week Due	contact hours
1	**Introduction To pharmaceutics**	Definitions and brief history of pharmaceutics, pharmacopeia, Definition of dosage form, the components, the need to dosage forms, classification of dosage forms	W1	2
2	**Pharmaceutical excipients**	Roles, types with examples • **Essential:** solvents, vehicles, emulsifying agents, binders, etc. • **Organoleptic** excipients: colorants, sweeteners, flavors • **Stabilizers:** buffers, preservatives, antioxidants, anti-cake, etc. • **Bioavailability enhancers** • **Excipients for other purposes**	W2	2

3	**Design of dosage form: Preformulation, Formulation and development**	• **Preformulation stage:** physicochemical properties and analytical data required. Scheme of preformulation, Compatibility testing.	W3	4
		• **Formulation:** general rules, sources of raw materials, economic impact • **Development** stage	W4	
4	**Old pharmaceutical dosage forms**	Definition; disadvantages of Galenicals, lozenges, cachets, pills, etc.	W5	2
5	**Introduction to Non-sterile Pharmaceutical solutions**	Definition of solutions, types, advantages, disadvantages, general method of preparation, enhancement of dissolution, excipients, types of waters	W6	2
6	**Aqueous Pharmaceutical solutions (1)**	Definition, General characters, advantages, disadvantages, method of preparation, formulations and excipients with examples of **Topical**: (aqueous Tinctures, Douches/washes, Enema, mouthwashes/gargle, nasal solutions, otic aqueous solutions)	W7	2
7	Mid-term Exam		W8	2
8	**Aqueous Pharmaceutical solutions (2)**	Definition, General characters, advantages, disadvantages, method of preparation, formulations and excipients with examples of	W9	4
		Oral: Syrups, linctus's, Elixirs , other oral solutions. **Adjuvant:** Aromatic waters, mucilage	W10	
9	**Non-Aqueous Pharmaceutical solutions**	Definition, General characters, advantages, disadvantages, method of preparation, formulations and excipients with examples of **Topical :** Alcoholic Tinctures,	W11	2

		Collodions, liniments, Glycerites (otic glycerite) **Oral:** oleovitamins **Adjuvant:** Spirit		
10	**Non-sterile liquid Dispersion systems (1)**	**Introduction** Definition, types: coarse dispersion, fine dispersion; compare disperse system and true solution ; compare colloids, suspensions, emulsions; general advantages and problems of disperse system **Coarse dispersions**	W12	4
		➢ **Suspensions** ○ Definition, types, advantages , disadvantages, ideal properties ○ Formulation: (flocculated, deflocculated) , excipients (suspending agents, flocculating agents; others) ○ Steps of preparation ○ Instability Problems : sedimentation; cake formation; evaluation and approaches to reduce ○ Packaging	W13	
11	**Non-sterile liquid Dispersion systems (2)**	➢ **Emulsions** ○ Definition, types, advantages, disadvantages ○ Formulation: excipients (Emulsifying agents; types and selection; HLB) ○ Methods of preparation: wet method, dry	W14	4

		○ method, bottle method ○ Self-emulsified emulsions ○ Instability problems: coalescence, braking, creaming, phase inversion; causes and how to reduce • **Fine dispersions** Definition, types, advantages, disadvantages, principles and method of preparations ➢ **Colloidal suspensions** • **Microemulsions and nanoemulsion:**	W15	
12	FINAL - EXAM		W16	2
Number of Weeks /and Units Per Semester			**16**	**32**

B - Practical Aspect:

Order	Tasks/ Experiments	Week Due	contact hours
Aqueous solutions			
1.	Iodine tincture	**W1**	**2**
2.	vaginal douches (sodium borate solution)	**W2**	**2**
3.	simple syrup (BP; USP)	**W3**	**2**
4.	Peppermint aromatic water	**W4**	**2**
5.	Oral rehydration solution	**W5**	**2**
6.	Preparation of elixir (paracetamol elixir)	**W6**	**2**
7.	Preparation of mouth wash	**W7**	**2**
Non-aqueous solutions			
8.	Peppermint spirit	**W8**	**2**
9.	camphor liniment	**W9**	**2**
10.	Otic glycerite	**W10**	**2**
Liquid disperse systems			
11.	calamine lotion (suspension)	**W11**	**2**
12.	Preparation of paracetamol (suspension)	**W12**	**2**
13.	emulsions (castor oil emulsion)	**W13**	**2**
14.	**PRACTICAL EXAM**	**W14**	**2**
Number of Weeks /and Units Per Semester		**14**	**28**

VII. Teaching strategies of the course:

- Lectures and Groups discussion.
- Practical presentations
- Self - learning.
- Discussions and Training
- Field visits
- Problem solving
- Practical classes
- Cooperative learning.
- Inductive and deductive

VIII. Assignments:

No	Assignments	Week Due	Mark
1	Class attendance and participation	weekly	5
2	Homework, presentation	11	5

IX. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method		Week Due	Mark	Proportion of Final Assessment
1	Assignments		1-14	10	**10%**
3	Mid-semester exam of theoretical part (written exam		**8**	**10**	**10%**
5	Lab. Term works	Attitude & Report	1-12	10	**10%**
6		Accomplishments			
7	Final exam (practical)		14	30	30%
8	Final exam of theoretical part (written exam)		16	40	40%
Total				100	100%

X. Learning Resources

1- Required Textbook(s) (maximum two).

1. Aulton M.E., Pharmaceutics: the science of dosage form design, 4th edition, 2010, Churchill Livingstone, UK
2. Ansel`s Pharmaceutical dosage forms and drug delivery system, 2011, Lippincott Williams and Wilkins, USA.

2- Essential References.

1. Williams and Wilkins (2005). Remington; the Science and Practice of Pharmacy (2first edition). Publisher: Lippincott.
2. Herbert A. Lieberman, Martin M. Reiger, GeilbertS.Banker Pharmaceutical Dosage Forms, Vol. 3 (Pharmaceutical Dosage Forms-Disperse), Third Edition, 2010.

3- Electronic Materials and Web Sites *etc*.

www.pubmed.com

XI. Course Policies:

1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam.
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** - Assignments and projects will be assessed individually unless the teacher request for group work.
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course.
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:**

Course Specification of Pharmacognosy (1)

I. Course Identification and General Information:

1	**Course Title:**	Pharmacognosy (1)				
2	**Course Code & Number:**	**PHA272**				
3	**Credit hours:**	C.H				TOTAL
		Th.	Seminar	practical	Training.	
		2		1		3
4	**Study level/ semester at which this course is offered:**	*2nd year / 1st semester*				
5	**Pre –requisite (if any):**	Pharmaceutical Botany				
6	**Co –requisite (if any):**	**None**				
7	**Program (s) in which the course is offered:**	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	**Language of teaching the course:**	**English**				
9	**Study System**	**Semester**				
10	**Mode of delivery:**	**Regular**				
11	**Location of teaching the course:**	**University**				
12	**Prepared By:**	**Dr. Abdulrahman Roshan**				

II. Course Description:

The course is designed to provide the student with basic information about pharmacognosy.
It is concerned with the study of drugs from natural sources mainly from plants, their cultivation, collection, drying, storage, adulteration and plant cell contents. It focuses on medicinal drugs from leaves, flowers, barks, with their active constituents, medicinal uses and macro and micro-morphological characters. It also covers drugs from animal sources. The students will also apply knowledge in performing some basic laboratory experiments.

III. Course Objectives:

At the end of this course, Student will be able to

1- Demonstrate knowledge of basic concept of pharmacognosy, crude drugs, official drugs, nomenclature and classification.
2- Learn the proper processes for preparing medicinal plants for commercial market (cultivation, collection, drying, packing, storage and preservation).
3- Describe the diagnostic characters) morphologically and microscopically) of the drugs from different organs of medicinal plants such as bark, leaves, flowers, roots and rhizomes.
4- Give an account on the active constituents of the studied drugs as well as their medicinal uses.

IV. Course Intended learning outcomes (CILOs) of the course		WRITE Symbol and number of PILOs
a.1	Recognize the principles of pharmacognosy; cultivation, collection, drying, storage of natural products and the factors affecting these processes.	**A2**
a.2	Outline the morphological and histological characters of different medicinal plants (e.g. leaves, flowers, barks) and drugs from animal sources.	**A2**
a.3	State the biological activity, active constituents, uses, chemical tests and common adulterants in the provided drugs in the course.	**A2, A3**
b.1	Determine unknown drugs; leaves, flowers, and barks (morphologically and microscopically) or animal drugs.	**B2**
b.2	Determine microscopical and chemical methods for qualitative evaluation of natural drugs.	**B2, B4**
c.1	Identify the authentication of any of the studied drugs (entire organ or in powdered form) and relate them to different plant organs or animal sources.	**C1**
c.2	Perform experiments to identify plant (powders) and animal drugs and detect adulteration according to good laboratory practice and professional standards.	**C1, C5**
d.1	Demonstrate independent and team working, research and communication skills.	**D1, D3**

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1- Recognize the principles of pharmacognosy; cultivation, collection, drying, storage of natural products and the factors affecting these processes.	Lecture and group discussion	Participation, quizzes and written exam
a2- Outline the morphological and histological characters of different medicinal plants (e.g. leaves, flowers, barks) and drugs from animal sources.		
a3- State the biological activity, active constituents, uses, chemical tests and common adulterants in the provided drugs in the course.		

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1- Determine unknown drugs; leaves, flowers, and barks (morphologically and microscopically) or animal drugs.	Lecture, discussion and problem based learning, practical (lab) classes	Oral presentation, written and practical examination
b2- Determine microscopical and chemical methods for qualitative evaluation of natural drugs.		

(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1- Identify the authentication of any of drugs (entire organ or in the studied powdered form) and relate them to different plant organs or animal sources.	- Laboratory work - Cooperative learning	Practical works, Practical reports and presentations based on their experimental work
c2- Perform experiments to identify plant (powders) and animal drugs and detect adulteration according to good laboratory practice and professional standards.		

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1- Demonstrate independent and team working, research and communication skills.	practical class, assignment and discussion in groups	Reports, presentations and communication with the lecturer and colleagues.

V. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	contact hours
1	Introduction to pharmacognosy	a1, b2, c1, d1	Pharmacognosy and its modern aspects. classification Cultivation, collection, drying, storage,	3	6

	Methods of crude drug evaluation	a1- a3, b1, b2, c2. d1	: Types of adulteration. Method of detection: Pharmacognosic methods Organoleptic methods.	1	2
2	Plant cell contents primary metabolites and secondary metabolites	a2, b2, d1	Starch, proteins, fixed oil and fats, volatile oils, crystals calcium oxalate, carbonate, and silica. Glycosides, alkaloids ,tannins, terpenes ,etc.	1	2
3	Medicinal leaves	a1-a4, b1, b2, c1, d1	Leaf definition, types, morphology and anatomy Leaves of: Senna, Hyoscyamus, Datura, Belladona, rosemary. Leaves of Digitalis Sage, Marjoram , Henna, Vinca, Laurel, Guajava and Eucalyptus.	1	2
4	Med- term exam	a1-a4, b1-b2, c1-c2, d1		1	2
5	Medicinal leaves	a1-a4, b1, b2, c1, d1	Leaves of Digitalis Sage, Marjoram , Henna, Vinca, Laurel, Guajava and Eucalyptus.	1	2
6	Medicinal Flowers	a1-a4, b1, b2, c1, d1	Flowers definition. types, morphological and anatomical properties. Flowers of Chamomile, Santonica, Pyrethrum and Hibiscus. Flowers of Calendula , Clove Sunflower, Tillia and Echinacea	2	4
7	Medicinal Barks	a1-a4, b1, b2, c1, d1	General properties of barks; bark of: Cinnamon, Cassia, Quiliaja, wild and cherry. Barks of: Cinchona, Cascara, frungula, Cinchona, Hammamilis, Salix and pomegranate.	2	4

8	Drugs of animal origin	a1-a4, b1, b2, c1, d1	Animal and animal products as Cochineal, Cantharides, Honey, Cod liver oil. Lard, Spermaceti, Lanolin, Beeswax and Musk.	2	4
9	General Revision	a1-a3, b1- b2, c1, c2, d1		1	2
10	Final exam	a2-a4, b3, c1, d1		1	2
			Number of Weeks /and Units Per Semester	**16**	**32**

B - Practical Aspect:

Order	Tasks/ Experiments	Number of Weeks	contact hours	Learning Outcomes
1	Introduction and laboratory skills	**1**	**2**	**a1, d1**
2	The key elements used in powder drug evaluation	**1**	**2**	**a2, a3, b1-b2, c1-c2, d1**
3	Macro and micro morphological study of Solanaceous leaves (Datura, Belladona, Hyoscyamus)	**1**	**2**	**a2, a3, b1-b2, c1-c2, d1**
4	Macro and micro-morphological study of leaves of: Senna, Guava and Digitalis	**1**	**2**	**a2, a3, b1-b2, c1-c2, d1**
5	Macro and micro-morphological study of Mentha, Thymus , Rosemary	**1**	**2**	**a2, a3, b1-b2, c1-c2, d1**
6	Macro and micro-morphological study of Marjoram, Sage, Vinca	**1**	**2**	**a2, a3, b1-b2, c1-c2, d1**
7	Macro and micro-morphological study of Clove, hibiscus, Santonica	**1**	**2**	**a2, a3, b1-b2, c1-c2, d1**
8	Macro and micro-morphological study of Calendula, Chamomile , Pyrethrum	**1**	**2**	**a2, a3, b1-b2, c1-c2, d1**
9	Macro and micro-morphological study of Cinchona Cassia Cinammon	**1**	**2**	**a2, a3, b1-b2, c1-c2, d1**
10	Macro and micro-morphological study of Quassia, Gall	**1**	**2**	**a2, a3, b1-b2, c1-c2, d1**
11	General chemical tests for the major	**1**	**2**	**a2, a3, b1-b2, c1-c2,**

	classes of secondary metabolites present in plants			**d1**
12	Presentation of the assignment (collection and drying different plant parts).	**1**	**2**	**a2, a3, b1-b2, c1-c2, d1**
13	Revision	**1**	**2**	**a2, a3, b1-b2, c1-c2, d1**
14	Practical exam	**1**	**2**	**a2, a3, b1-b2, c1-c2, d1**
Number of Weeks /and Units Per Semester		**14**	**28**	

VI. Teaching strategies of the course:

- Lecture
- Group discussion
- Problem based learning
- Practical (lab) classes
- Assignment
- Cooperative learning

VII. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Collection and drying different plant parts+ Information about the plant	**a1, b2 ,d1**	12	5%
2	Lab reports	**a2, a3, b1, b2, c1, c2, d1**	12-8 ,1-6	10%

VIII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Attendance/ quiz	All	5	5%	
2	Lab reports	1-6, 8-12	10	10%	a2, a3, b1, b2, c1, c2, d1
3	Med- Term Exam	7	10	10%	a1-a4, b1-b2, c1-c2, d1
4	Research assignment	12	5	5%	a1, b2 ,d1
5	Practical exam	14	30	30%	a2, a3, b1-b2, c1-c2, d1

6	Final written exam	16	40	40%	a2-a4, b3, c1, d1
7	Total		100	100%	

IX. Learning Resources:

1- Required Textbook(s) (maximum two).

1- Evans, William Charles, Evans, Daphne, & Trease, George Edward. (2009). Trease and Evans pharmacognosy (16th ed. / rev. with the assistance of Daphne Evans.). Saunders/Elsevier.
2- Shah Biren N., Seth A.K. (2010). Textbook of Pharmacognosy and Phytochemistry, First Edition, Elsevier,

2- Essential References.

1- Heinrich M., Barnes J., Garcia J., Gibbons S., Williamson E. (2018) Fundamentals of Pharmacognosy and Phytotherapy 3rd Edition, Saunders/Elsevier
2-Graff A. (2011) American Herbal Pharmacopoeia: Botanical Pharmacognosy-Microscopic Characterization of Botanical Medicines. Taylor and Francis

3- Electronic Materials and Web Sites *etc.*

1- http://www.botanical.com
2- American Botanical Council (ABC) https://www.herbalgram.org

X. Course Policies:

1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects**: - Assignments and projects will be assessed individually unless the teacher request for

	group work
5	**Cheating:** - Cheating by any means will cause the student failure and he/she must re-study the course
6	**Plagiarism:** Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:** -

Template for Course Plan (Syllabus) of Pharmacognosy (1)

I. - Information about Faculty Member Responsible for the Course:

		Office Hours					
Name of Faculty Member							
Location& Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Identification and General Information:

1	Course Title:	Pharmacognosy (1)				
2	Course Number & Code:	PHA272				
3	Credit hours:	C.H				Total
		Th.	Seminar	Pr.	F. Tr.	
		2		1		3
4	Study level/year at which this course is offered:	*2nd year / 1st semester*				
5	Pre –requisite (if any):	Pharmaceutical Botany				
6	Co –requisite (if any):					
7	Program (s) in which the course is offered	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	Language of teaching the course:	English				
9	System of Study:	Semester				
10	Mode of delivery:	Regular				
11	Location of teaching the course:	University				

III. Course Description:

The course is designed to provide the student with basic information about pharmacognosy.

It is concerned with the study of drugs from natural sources mainly from plants, their cultivation, collection, drying, storage, adulteration and plant cell contents. It focuses on medicinal drugs from leaves, flowers, barks, with their active constituents, medicinal uses and macro and micro-morphological characters. It also covers drugs from animal sources. The students will also apply knowledge in performing some basic laboratory experiments.

IV. Course Objectives:

At the end of this course, Student will be able to

1- Demonstrate knowledge of basic concept of pharmacognosy, crude drugs, official drugs, nomenclature and classification.

2- Learn the proper processes for preparing medicinal plants for commercial market (cultivation, collection, drying, packing, storage and preservation).

3- Describe the diagnostic characters (morphologically and microscopically) of the drugs from different organs of medicinal plants such as bark, leaves, flowers, roots and rhizomes.

4- Give an account on the active constituents of the studied drugs as well as their medicinal uses.

V. Intended learning outcomes (ILOs) of the course:

- Brief summary of the knowledge or skill the course is intended to develop:

1- Recognize the principles of pharmacognosy; cultivation, collection, drying, storage of natural products and the factors affecting these processes.
2- Outline the morphological and histological characters of different medicinal plants (e.g. leaves, flowers, barks) and drugs from animal sources.
3- State the biological activity, active constituents, uses, chemical tests and common adulterants in the provided drugs in the course.
4- Determine unknown drugs; leaves, flowers, and barks (morphologically and microscopically) or animal drugs.
5- Determine microscopical and chemical methods for qualitative evaluation of natural drugs.
6- Identify the authentication of any of the studied drugs (entire organ or in powdered form) and relate them to different plant organs or animal sources.
7- Perform experiments to identify plant (powders) and animal drugs and detect adulteration according to good laboratory practice and professional standards.
8- Demonstrate independent and team working, research and communication skills.

VI. Course Content:

- Distribution of Semester Weekly Plan of Course Topics/Items and Activities.

A – Theoretical Aspect:

Order	Topics List	Week Due	Contact Hours
1	Introduction to pharmacognosy	1st	2
2	Pharmacognosy and its modern aspects . Classification of medicinal plant ,	2nd	2
3	Cultivation, collection, drying and storage of medicinal plant	3rd	2

4	Methods of crude drug evaluation: Types of adulteration. Method of detection: Pharmacognosic methods Organoleptic methods.	4th	2
5	Plant cell contents primary metabolites and secondary metabolites Starch, proteins, fixed oil and fats, volatile oils, crystals calcium oxalate, carbonate, and silica. Glycosides, alkaloids, tannins, terpenes ,etc.	5th	2
6	Medicinal leaves: definition, types, morphology and anatomy Leaves of: Senna, Hyoscyamus, Datura, Belladona, rosemary.	6th	2
7	Med- term exam	7th	2
8	Leaves of Digitalis, Sage, Marjoram, Henna, Vinca, Laurel, Guajava and Eucalyptus.	8th	2
9	Medicinal Flowers: definition. types, morphological and anatomical properties. Flowers of Chamomile, Santonica and Pyrethrum.	9th	2
10	. Medicinal Flowers: Hibiscus, Calendula , Clove Sunflower, Tillia and Echinacea.	10th	2
11	Medicinal Barks: General properties; bark of: Cinnamon, Cassia, Quiliaja, wild and cherry.	11th	2
12	Medicinal Barks: Cinchona, Cascara, frungula, Cinchona, Hammamilis, Salix and pomegranate.	12th	2
13	Animal and animal products: Cochineal, Cantharides, Honey, Cod liver oil.	13th	2
14	Animal and animal products: Lard, Spermaceti, Lanolin, Beeswax and Musk.	14th	2
15	General Revision	15th	2
16	Final exam	16th	2
Number of Weeks /and Units Per Semester		**16**	**32**
B – Practical Aspect:			

Order	Topics List	Week Due	Contact Hours
1	Introduction and laboratory skills	1st	2
2	The key elements used in powder drug evaluation	2nd	2
3	Macro and micro morphological study of Solanaceous leaves (Datura, Belladona, Hyoscyamus)	3rd	2
4	Macro and micro-morphological study of leaves of: Senna, Guava and Digitalis	4th	2
5	Macro and micro-morphological study of Mentha, Thymus, Rosemary	5th	2
6	Macro and micro-morphological study of Marjoram, Sage, Vinca	6th	2
7	Macro and micro-morphological study of Clove, hibiscus, Santonica	7th	2
8	Macro and micro-morphological study of Calendula, Chamomile, Pyrethrum	8th	2
9	Macro and micro-morphological study of Cinchona Cassia Cinammon	9th	2
10	Macro and micro-morphological study of Quassia, Gall	10th	2
11	General chemical tests for the major classes of secondary metabolites present in plants	11th	2
12	Presentation of the assignment (collection and drying different plant parts).	12th	2
13	Revision	13th	2
14	Practical exam	14th	2
Number of Weeks /and Units Per Semester		**14**	**28**

VII. Teaching strategies of the course:

- Lecture
- Group discussion
- Problem based learning
- Practical (lab) classes
- Assignment
- Cooperative learning

VIII. Assignments:

No	Assignments	Week Due	Mark
1	Collection and drying different plant parts	12	5%
2	Lab reports	All	10%

IX. Schedule of Assessment Tasks for Students During the Semester:

Assessment	Type of Assessment Tasks	Week Due	Mark	Proportion of Final Assessment
1	Attendance/ quiz	All	5	5%
2	Lab reports	All	10	10%
3	Med- Term Exam	7	10	10%
4	Research assignment	12	5	5%
5	Practical exam	14	30	30%
6	Final written exam	16	40	40%
7	Total		100	100%

X. Learning Resources:

1- Required Textbook(s) (maximum two).

1- Evans, William Charles, Evans, Daphne, & Trease, George Edward. (2009). Trease and Evans pharmacognosy (16th ed. / rev. with the assistance of Daphne Evans.). Saunders/Elsevier.
2- Shah Biren N., Seth A.K. (2010). Textbook of Pharmacognosy and Phytochemistry, First Edition, Elsevier,

2- Essential References.

1- Heinrich M., Barnes J., Garcia J., Gibbons S., Williamson E. (2018) Fundamentals of Pharmacognosy and Phytotherapy 3rd Edition, Saunders/Elsevier
2-Graff A. (2011) American Herbal Pharmacopoeia: Botanical Pharmacognosy-Microscopic Characterization of Botanical Medicines. Taylor and Francis

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1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam.
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** - Assignments and projects will be assessed individually unless the teacher request for group work.
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course.
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:**

Course Specification of Pharmacy regulations and ethics

I. Course Identification and General Information:

1	Course Title:	Pharmacy regulations and ethics				
2	Course Code & Number:	PHA281				
3	Credit hours:	C.H				TOTAL
		Th.	Seminar	practical	Training.	
		2				2
4	Study level/ semester at which this course is offered:	Second level, first semester				
5	Pre –requisite (if any):	Orientation to Pharmacy				
6	Co –requisite (if any):					
7	Program (s) in which the course is offered:	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	Language of teaching the course:	Arabic Language				
9	Study System	Semester				
10	Mode of delivery:	Regular				
11	Location of teaching the course:	University				
12	Prepared By:	Dr. Hamad Mahmood Alshabi				

II. Course Description:

This course introduces the students about the laws and regulations that govern and affect the practice of pharmacy, legal principles for non-controlled and controlled prescriptions, OTC drug requirements, opening new pharmacies, opening medical stores, opening factories, import and export of medicines; and medical supplies, regulation of distribution and sale of medicines and medical supplies and regulation of narcotic and psychotropic substances. The course also covers the ethics in pharmacy practice, code of ethics and pharmacist relationship with other health professional and patient.

III. Course Objectives:

Upon successful completion of this course, the students should be able to:
1- Demonstrate a good awareness and understanding of laws and regulations regarding to the practice of pharmacy.
2- Understand the ethics of pharmacy profession.

IV. Course Intended learning outcomes (CILOs) of the course		WRITE Symbol and number of PILOs
a.1	Recognize the laws and regulations that govern the practice of pharmacy.	**A5**
a.2	Recognize the ethics related to pharmacy practice.	**A5**
a.3	Describe legal principles for non-controlled and controlled prescription.	**A5**
b.1	Practice thinking skills in solving problems that a pharmacist faced during practice regarding laws, legislation and ethics of pharmacy practice.	**B4**
c.1	Apply the rules, regulations, legislation and ethics governing the practice of pharmacy.	**C2, C4, C5**
d.1	Communicate effectively and ethically with patients, public, and health care professionals.	**D1**
d.2	Demonstrate professional and ethical behaviour.	**D2**

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1- Recognize the laws and regulations that govern the practice of pharmacy.	- Interactive Lectures - Self-Learning - Assignments	- - Written Exams (midterm and final) - Assignments & Coursework Activities - Quizzes
a2- Recognize the ethics related to pharmacy practice.		
a.3. Describe legal principles for non-controlled and controlled prescription.		

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1- Practice thinking skills in solving problems that a pharmacist faced during practice regarding laws, legislation and ethics of pharmacy practice.	- Case study - Problem-based Learning - Simulation	- Multiple Choice Questions (MCQs) - Problem Solving Exercise - Cases Presentation

(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to

Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	**Teaching strategies**	**Assessment Strategies**
c1- Apply the rules, regulations, legislation and ethics governing the practice of pharmacy.	- Case study - Problem-based Learning - Simulation	- Problem Solving Exercise - Cases Presentation

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	**Teaching strategies**	**Assessment Strategies**
d1- Communicate effectively and ethically with patients, public, and health care professionals.	- Discussion - Assignments	- Oral Presentation & discussion - Assignments **&** reports
d2- Demonstrate professional and ethical behaviour.		

V. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	contact hours
1	مقدمة	a1	مقدمة حول التشريعات الصيدلانية الهيئات التنظيمية ومهامها: الهيئة العليا للأدوية والمستلزمات الطبية, المجلس الطبي, ونقابة الصيادلة	1	2
2	قانون مزاولة مهنة الصيدلة	a1, b1, c1, d1	التعاريف, الهدف, الترخيص وشروط مزاولي مهنة الصيدلة, الحقوق والواجبات, المخالفات والعقوبات	2	4
3	تنظيم صناعة وتجارة الادوية والمستلزمات الطبية	a1, b1, c1, d1	- قواعد فتح المؤسسات الصيدلانية (الصيدليات الخاصة والعامة, مخازن الادوية, شركات ومصانع الادوية) تسجيل الادوية والمستلزمات الطبية	1	2
4	تنظيم صناعة وتجارة الادوية والمستلزمات الطبية	a1, b1, c1, d1	استيراد وتصدير الادوية والمستلزمات الطبية	1	2
5	تنظيم صناعة وتجارة الادوية والمستلزمات الطبية	a1, b1, c1, d1	توزيع وبيع الادوية والمستلزمات الطبية	1	2
6	تنظيم صناعة وتجارة الادوية والمستلزمات الطبية	a1, b1, c1, d1	المخالفات والعقوبات	1	2

7		a1, b1, c1	امتحان نصفي	1	2
8	الوصفات الطبية	a1, a3, b1, c1, d1, d2	الوصفات الطبية, ادوية بدون وصفة, ادوية بوصفة طبية	1	2
9	قانون مكافحة المخدرات وتنظيم استعمالها والاتجار فيها	a1, a3, b1, c1, d1	جداول المواد المخدرة والمؤثرات العقلية	1	2
10	قانون مكافحة المخدرات وتنظيم استعمالها والاتجار فيها	a1, a3, b1, c1, d1	طرق تخزين وصرف المواد المخدرة والمؤثرات العقلية المخالفات والعقوبات	2	4
11	اخلاقيات مهنة الصيدلة	a2, b1, c1, d1, d2	اخلاقيات مهنة الصيدلة القواعد العامة التي تحكم اخلاقيات المهن الطبية	2	4
12	اخلاقيات مهنة الصيدلة	a2, b1, c1, d1, d2	علاقة الصيدلي بالمريض والممرض والطبيب	1	2
13		a1, a2, a3, b1, c1	امتحان نهائي	1	2
Number of Weeks /and Units Per Semester				16	32

VI. Teaching strategies of the course:

- Interactive Lectures
- Self-Learning
- Assignments
- Case study
- Problem-based Learning
- Simulation

VII. Assignments:

No	Assignments	Aligned CILOs (symbols)	Week Due	Mark
1	Participation, Homework Assignments	**a1, a2, a3, b1, c1, d1, d2**	Weekly	5
	Total Score			5

VIII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Tasks and Assignments	**1-14**	**5**	**5 %**	**a1, a2, a3, b1, c1, d1, d2**
2	Quizzes 1	**W6**	**2.5**	**2.5 %**	a1, a2, a3
3	Mid-term exam	**W8**	**20**	**20 %**	a1, b1, c1
4	Quizzes 2	**W12**	**2.5**	**2.5 %**	a1, a2, a3
5	Final exam	**W16**	**70**	**70 %**	a1, a2, a3, b1, c1
6	**Total**		**100**	**100%**	

IX. Learning Resources:

1- Required Textbook(s) (maximum two).

1- Appelbe GE, Wingfield J. 2009. Dale and Appelbe's Pharmacy Law and Ethics, 9th edn. Pharmaceutical Press., London.
2- Adeboye Adejare (2021). Remington; the Science and Practice of Pharmacy (23th edition). Publisher: Elsevier Inc.

2- Essential References.

1- Course notes prepared by the staff members
2- Law No. (26) 2002 for practicing of Medical and pharmacy professions (available only in Arabic).
3- Cabinet Decree No. (333) 2004 for regulation of trade and manufacturing of medicines and medical appliances and its relatives (available only in Arabic).
4- Law No. 3 /1993 for struggler and control of narcotics & psychotropic substances and precursors and its trade. (under the Ministry Of Interior).

3- Electronic Materials and Web Sites *etc.*

- www.sbd-ye.org/sbdye/files/pdf/2.pdf
- www.sbd-ye.org

X. Course Policies:

1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:**

	- any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** - Assignments and projects will be assessed individually unless the teacher request for group work
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:** -

Template for Course Plan (Syllabus) of Pharmacy Regulations and Ethics

I. - Information about Faculty Member Responsible for the Course:

		Office Hours					
Name of Faculty Member							
Location& Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Identification and General Information:

1	Course Title:	Pharmacy regulations and ethics				
2	Course Code & Number:	PHA281				
3	Credit hours:	C.H				TOTAL
		Th.	Seminar	practical	Training.	
		2				2
4	Study level/ semester at which this course is offered:	Second level, first semester				
5	Pre –requisite (if any):	Orientation to Pharmacy				
6	Co –requisite (if any):					
7	Program (s) in which the course is offered:	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	Language of teaching the course:	Arabic Language				
9	Study System	Semester				
10	Mode of delivery:	Regular				
11	Location of teaching the course:	University				

III. Course Description:

This course introduces the students about the laws and regulations that govern and affect the practice of pharmacy, legal principles for non-controlled and controlled prescriptions, OTC drug requirements, opening new pharmacies, opening medical stores, opening factories, import and export of medicines; and medical supplies, regulation of distribution and sale of medicines and medical supplies and regulation of narcotic and psychotropic substances. The course also covers the ethics in pharmacy practice, code of ethics and pharmacist relationship with other health professional and patient.

IV. Course Objectives:

Upon successful completion of this course, the students should be able to:
1- Demonstrate a good awareness and understanding of laws and regulations regarding to the practice of pharmacy.
2- Understand the ethics of pharmacy profession.

V. Intended learning outcomes (ILOs) of the course:

Upon successful completion of this course, the student should be able to:

1- Recognize the laws and regulations that govern the practice of pharmacy.
2- Recognize the ethics related to pharmacy practice .
3- Describe legal principles for non-controlled and controlled prescription.
4- Practice thinking skills in solving problems that a pharmacist faced during practice regarding laws, legislation and ethics of pharmacy practice .
5- Apply the rules, regulations, legislation and ethics governing the practice of pharmacy .
6- Communicate effectively and ethically with patients, public, and health care professionals.
7- Demonstrate professional and ethical behaviors.

VI. Course Content:

A – Theoretical Aspect:

Order	Topics List	Week Due	Contact Hours
1	مقدمة حول التشريعات الصيدلانية الهيئات التنظيمية ومهامها: الهيئة العليا للأدوية والمستلزمات الطبية, المجلس الطبي, ونقابة الصيادلة	1	2
2	**قانون مزاولة مهنة الصيدلة** التعاريف, الهدف, الترخيص وشروط مزاولي مهنة الصيدلة, الحقوق والواجبات, المخالفات والعقوبات	2, 3	4
3	**تنظيم صناعة وتجارة الادوية والمستلزمات الطبية** - قواعد فتح المؤسسات الصيدلانية (الصيدليات الخاصة والعامة, مخازن الادوية, شركات ومصانع الادوية) تسجيل الادوية والمستلزمات الطبية	4	2
4	استيراد وتصدير الادوية والمستلزمات الطبية	5	2
5	توزيع وبيع الادوية والمستلزمات الطبية	6	2

6	المخالفات والعقوبات	7	2
7	**امتحان نصفي**	8	2
8	**تصنيف الادوية والوصفات الطبية** الوصفات الطبية, ادوية بدون وصفة, ادوية بوصفة طبي	9	2
9	**قانون مكافحة المخدرات وتنظيم استعمالها والاتجار فيها** جداول المواد المخدرة والمؤثرات العقلية	10	2
10	طرق تخزين وصرف المواد المخدرة والمؤثرات العقلية المخالفات والعقوبات	11, 12	4
11	اخلاقيات مهنة الصيدلة القواعد العامة التي تحكم اخلاقيات المهن الطبية	13, 14	4
12	علاقة الصيدلي بالمريض والممرض والطبيب	15	2
11	**Final Term exam**	16	2
Number of Weeks /and Units Per Semester		**16**	**32**

VII. Teaching strategies of the course:

- Interactive Lectures
- Self-Learning
- Assignments
- Case study
- Problem-based Learning
- Simulation

VIII. Assignments:

No	Assignments		Week Due	Mark
1	Participation, Homework Assignments		weekly	5
	Total Score			5

IX. Schedule of Assessment Tasks for Students During the Semester:

Assessment	Type of Assessment Tasks	Week Due	Mark	Proportion of Final

				Assessment
1	Tasks and Assignments	1-14	5	5%
2	Quizzes 1	W6	2.5	2.5 %
3	Mid-term exam	W8	20	20 %
4	Quizzes 2	W12	2.5	2.5 %
5	Final exam	W16	70	70 %
6	**Total**		100	100%

X. Learning Resources:

1- Required Textbook(s) (maximum two).

1- Appelbe GE, Wingfield J. 2009. Dale and Appelbe's Pharmacy Law and Ethics, 9th edn. Pharmaceutical Press., London.

2- Adeboye Adejare (2021). Remington; the Science and Practice of Pharmacy (23th edition). Publisher: Elsevier Inc.

2- Essential References.

1- Course notes prepared by the staff members

2- Law No. (26) 2002 for practicing of Medical and pharmacy professions (available only in Arabic).

3- Cabinet Decree No. (333) 2004 for regulation of trade and manufacturing of medicines and medical appliances and its relatives (available only in Arabic).

4- Law No. 3 /1993 for struggler and control of narcotics & psychotropic substances and precursors and its trade. (under the Ministry Of Interior).

3- Electronic Materials and Web Sites *etc*.

- www.sbd-ye.org/sbdye/files/pdf/2.pdf
- www.sbd-ye.org

XI. Course Policies:

1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam.
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be

	allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** - Assignments and projects will be assessed individually unless the teacher request for group work.
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course.
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:**

Second Level, Second Semester

Course Specification of Analytical Chemistry

I.	Course Identification and General Information:					
1	Course Title:	Analytical Chemistry				
2	Course Code & Number:	**MED215**				
3	Credit hours:	C.H				TOTAL
		Th.	Seminar	practical	Training.	
		2		1		3
4	Study level/ semester at which this course is offered:	Second level, second semester				
5	Pre –requisite (if any):	General chemistry				
6	Co –requisite (if any):	None				
7	Program (s) in which the course is offered:	**Bachelor of pharmaceutical Sciences (B. Pharm. Sc)**				
8	Language of teaching the course:	English				
9	Study System	Semester-based				
10	Mode of delivery:	Regular				
11	Location of teaching the course	University				
12	Prepared By:	Dr. Abdulkader Qahtan				

II. Course Description:

This course includes the principles of qualitative and quantitative analysis, methods expressing of the concentrations, statistical handling of data, principles of volumetric analysis ((Neutralization, Precipitation, Complexometric and Oxidation Reduction titrations) and Gravimetric Analysis. This course also covers the applications of these methods to pharmaceutical products. This course also involves practical experiments.

III. Course Objectives:

This course aims to make the students able to:

1. Know the special language, basic tools and methods of chemical analysis.
2. Develop suitable methods to solve analytical problems in pharmaceutical products
3. Interprete and evaluate analytical results.
4. Comprehend the basic ideas of expressing analytical concentration.

5. Demonstrate critical thinking, problem- solving, and decision making, when dealing with theoretical and practical chemical information in this course.
6. Work effectively as part of a team to collect and /or to produce reports and presentation.

IV. Course Intended learning outcomes (CILOs) of the course		WRITE Symbol and number of PILOs
After completing this course, students will be able to:		
a.1	Understand the theoretical, practical and mathematical principles of different analytical methods.	A1
a.2	Identify the chemical calculations and statistical handling of data related to chemical analysis.	A2
b.1	Select appropriate method to conduct qualitative and quantitative analysis of specific drugs.	B2
b.2	Develop and design suitable methods for identification, preparation, standardization and analysis of chemical and pharmaceutical compounds.	B3
c.1	Employ the different methods of analysis, preparation, standardization to solve analytical problems	C1
c.2	Handle and dispose the chemical and pharmaceutical preparations safely and effectively.	C5
d.1	Demonstrate critical thinking, problem- solving, and decision making, when dealing with theoretical and practical chemical information in this course.	D2
d.2	Work effectively in a team to perform the required tasks in field of analytical chemistry.	D3

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:		
Knowledge and Understanding	Teaching strategies	Assessment Strategies
After completing this course, students will be able to:		
a1- Understand the theoretical, practical and mathematical principles of different analytical	- Lecture - Interactive class	- Written examination,

methods.	discussions - Practical sessions	- Quizzes - Problem – solving exercise.
a2- Identify the chemical calculations and statistical handling of data related to chemical analysis.		

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Intellectual Skills	Teaching strategies	Assessment Strategies
After completing this course, students will be able to:	- Lecture - Interactive class discussions - Practical sessions - Problem- solving - Case study	-Written examination - Practical examination - Problem – solving exercise. -Reports - Assignments
b1- Select appropriate method to conduct qualitative and quantitative analysis of specific drugs.		
b2- Develop and design suitable methods for identification, preparation, standardization and analysis of chemical and pharmaceutical compounds.		

(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		
Professional and Practical Skills	Teaching strategies	Assessment Strategies
After completing this course, students will be able to:	- Lecture - Interactive class discussions - Practical sessions - Problem- solving	-Written examination - Practical examination - Problem –solving exercise. -Reports - Assignments
c1- Employ the different methods of analysis, preparation, standardization to solve analytical problems		
c2- Handle and dispose the chemical and pharmaceutical preparations safely and effectively.		

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:		
General and Transferable Skills	Teaching strategies	Assessment Strategies
After completing this course, students will be able to:		-Written
d1- Demonstrate critical thinking,		

problem- solving, and decision making, when dealing with theoretical and practical chemical information in this course.	- Interactive discussions - Practical sessions - Problem- solving - Web-based study	examination - Practical examination - Problem –solving exercise. -Reports - Assignments
d2- Work effectively in a team to perform the required tasks in field of analytical chemistry.		

V. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Learning Outcomes	Sub Topics List	No. of Weeks	contact hours
1	Introduction to the Analytical Chemistry	a1,a2 ,d1	- Introduction - Importance and role of chemical analysis in pharmaceutical sciences - Chemical analysis methods - Steps in chemical analysis - Fundamental numbers and units of measure	1	2
2	The Language of Analytical Chemistry	a1,a2,b2,d2	- Analysis, Determination, Measurement - Techniques, Methods, procedures, protocols -Statistical Handling of Data (mean, median, range, accuracy, precision, Relative and absolute error, standard deviation & coefficient of variation) - Errors in chemical analysis	1	2
3	Basic Tools of Analytical Chemistry	a1,a.2,b1,b 2,d2	- Concentration units (normality, molality, w/w %, w/v%, v/v%, ppm, ppb) and conversion between concentration units	2	4

			- Stoichiometric calculations		
4	Volumetric Analysis	a1,a2, b1,b2, c1,d2	- Requirements, Terms and Definitions - Titration, primary standard, standard solution, standardization, titration curves, equivalence point, end point, titration error and indicators) - Types of reactions in volumetric analysis -Types of titrations	1	2
5	Neutralization titrations	a1,a2, b1,b2, c1,d1	- Solutions: definitions and types. -Acid and Base theories - Chemical equilibrium and equilibrium constant - Ka, pKa and Kw calculations - pH calculations - Acid and Base titration, indicators - Titration curves - Aqueous and non-aqueous titrations - Analytical applications	2	4
6	Med term Exam	a1,a2,b1,b2 ,b		1	2
7		a1,a2, b1,b2, c1,d2	- Buffer solutions: definition, buffer capacity, - pH calculation and preparation of buffers - Physiological buffers - Henderson -Hasselbalch equation - Analytical applications	1	2
8	Precipitation titrations	a1,a2, b1,b2,d2	- Precipitation Reaction, Solubility and Ksp. - Precipitation titrations;	1	2

			requirements and argentimetric titration curves. - Volhard's method, Fajan's method and Mohr's method - Analytical applications		
9	Complexometric titrations	a1,a2,b1,b2 ,c1,d2	- The concept of complexation reaction and stability constant. -Ligands definition and characterization, examples. - EDTA as a ligand.	1	2
10		a1,a2, b1,b2,d2	-Titration curves; problems and indicators. - Titration methodologies, Masking agents and selectivity of EDTA	1	2
11	Oxidation-Reduction titrations (Redox)	a1,a2 b1,b2, b4,d2	- Redox half cell reactions - Calculating oxidation number - Balancing redox reactions - Electrochemical cells: Galvanic, electrolytic, reversible and irreversible cells, schematic representation of cells	1	2
12		a1,a2, b1,b2,d2	-Standard Electrode potential and cell potential - Nernst equation. - Applications: pH-determination, concentration cells and determination of equilibrium constant -Some common reducing and oxidizing agents. - Redox titrations - Analytical applications	1	2
13	Gravimetric Analysis	a1,a2, b1,b2,d1	- Basic concepts -Properties of precipitates and precipitating agents. - Analytical applications	1	2

14	Final Exam	a1,a2,b1,b2 ,d1		1	2
Number of Weeks /and Units Per Semester				**16**	**32**

B - Practical Aspect:

Order	Tasks/ Experiments	Number of Weeks	contact hours	Learning Outcomes
1	Introduction, laboratory safety and orientation	**1**	**2**	a1,c3
2	Preparation of solutions: Handling of balances and volumetric glassware (preparation of 0.1 M NaCl and 0.1 M HCl	**1**	**2**	a1,b2,c1,c2,d1
3	Standardization of 0.1N HCl Determination of carbonate and bicarbonate in a mixture.	**1**	**2**	a1,b2,c1,c2,d2
4	Determination of aspirin (Back titration) .	**1**	**2**	a1,b2,c1,c2d,1
5	Non aqueous titrations: -Standardization of 0.1M perchloric acid -Determination of metronidazole by non aqueous titration.	**1**	**2**	a1,b2,c1,c2,d1
6	Precipitation Titrations: - Determination of sodium chloride (Mohr's method) - Determination of bromide (Volhard's method) - Determination of a mixture of chloride and iodide (Fajan's method).	**2**	**4**	a1,b2,c1,c2,d2
8	Complexometric titrations with EDTA: - Determination of magnesium sulfate - Determination of calcium chloride -Determination of calcium and magnesium in a mixture	**2**	**4**	a1,b2,c1,c2
9	Redox titrations: - Standardization of potassium permanganate	**1**	**2**	a1,b2,c1,c2,d1

	- Determination of ferrous sulfate			
10	- Standardization of 0.1M iodine - Determination of mixture of iodine and potassium iodide - Determination of ascorbic acid	**2**	**4**	a1,b2,c1,c2,d2
11	Gravimetric analysis: Determination of calcium as calcium oxalate monohydrate	**1**	**2**	a1,b2,c1,c2 ,c3,d3
12	Final Exam	**1**	**2**	a1,b2,c1,c2
Number of Weeks /and Units Per Semester		**14**	**28**	

VI. Teaching strategies of the course:

- Lectures
- Interactive class discussions
- Practical sessions
- Assignments
- Case study
- Web-based study
- Problem- solving

VII. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Homework Assignments	a1,b1,b2,c1,d1,d2,	3,6,9,12	5

VIII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Homework / Tasks/Assignments	3,6,9,12	5	5%	a1,b1,b2,c1,d1,d2
2	Quiz	4	5	5%	a1,a2,b1
3	Mid-term Exam	8	10	10%	a1,a2,b1,b2
4	Practical lab work	Every week	10	10%	a1,b2,c1,c2

5	Final Practical Exam	14	30	30%	a1,b2,c1,c2
6	Final theoretical Exam	16	40	40%	a1,a2,b1,b2
	Total		100	100%	

IX. Learning Resources:

1- Required Textbook(s) (maximum two).

1- Donald West, F. James Holler, Douglas A. Skoog, Stanley R. Crouch, 2014, Fundame of Analytical Chemistry (Brooks/Cole – Thomson Learning), 9th edition.
2- D.A. Skoog, D.M. West, F.J. Holler and S.R. Crouch, 2004, Fundamentals of Analytic Chemistry, Brooks/Cole ' 8ed.

2- Essential References.

1- Gary D. Christian, Purnendu K. Dasgupta and Kevin A. Schug, 2014 (Analytical Chemistry), 7th edition, WILEY.
2- Daniel C. Harris, 2007, (Quantitative Chemical Analysis), 7th edition, (W. H. Freeman and Company).
3- Douglas A. Skoog, Donald M. West, F. James Holler and Stanely R. Crouch, 2000, (Analytical Chemistry: An Introduction), 7th edition, (Saunders Golden Sunburst series).

3- Electronic Materials and Web Sites *etc*.

1. http://www.chemweb.com
2. http://www.sciencedirect.com
3. http://www.rsc.org
4. http://www.iingroups.com/idl(springer)
5. http://www.4chem.com/vb3

X. Course Policies:

1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be

	allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects**: - Assignments and projects will be assessed individually unless the teacher request for group work
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the faculty rules.
7	**Other policies**:

Template for Course Plan (Syllabus) Analytical Chemistry

I. Information about Faculty Member Responsible for the Course:

		Office Hours					
Name of Faculty Member							
Location& Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Identification and General Information:

1	Course Title:	Analytical Chemistry				
2	Course Code & Number:	**MED215**				
3	Credit hours:	C.H				TOTAL
		Th.	Seminar	practical	Training.	
		2		1		3
4	Study level/ semester at which this course is offered:	Second level, second semester				
5	Pre –requisite (if any):	General chemistry				
6	Co –requisite (if any):	None				
7	Program (s) in which the course is offered:	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	Language of teaching the course:	English				
9	Study System	Semester-based				
10	Mode of delivery:	Regular				
11	Location of teaching the course	University				

III. Course Description:

This course includes the principles of qualitative and quantitative analysis, methods expressing of the concentrations, statistical handling of data, principles of volumetric analysis ((Neutralization, Precipitation, Complexometric and Oxidation Reduction titrations) and Gravimetric Analysis. This course also covers the applications of these methods to pharmaceutical products. This course also involves practical experiments.

IV. Course Objectives:

This course aims to make the students able to:

1- Know the special language, basic tools and methods of chemical analysis.
2- Develop suitable methods to solve analytical problems in pharmaceutical products
3- Interprete and evaluate analytical results.
4- Comprehend the basic ideas of expressing analytical concentration.
5- Demonstrate critical thinking, problem- solving, and decision making, when dealing with theoretical and practical chemical information in this course.
6- Work effectively as part of a team to collect and /or to produce reports and presentation.

V. Course Intended learning outcomes (CILOs) of the course

After completing this course, students will be able to:

1	Understand the theoretical, practical and mathematical principles of different analytical methods.
2	Identify the chemical calculations and statistical handling of data related to chemical analysis.
3	Select appropriate method to conduct qualitative and quantitative analysis of specific drugs.
4	Develop and design suitable methods for identification, preparation, standardization and analysis of chemical and pharmaceutical compounds.
5	Employ the different methods of analysis, preparation, standardization to solve analytical problems
6	Handle and dispose the chemical and pharmaceutical preparations safely and effectively.
7	Demonstrate critical thinking, problem- solving, and decision making, when dealing with theoretical and practical chemical information in this course.
8	Work effectively in a team to perform the required tasks in field of analytical chemistry.

VI. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Sub Topics List	No. of Weeks	contact hours
1	Introduction to the Analytical Chemistry	- Introduction - Importance and role of chemical analysis in pharmaceutical sciences - Chemical analysis methods - Steps in chemical analysis - Fundamental numbers and units of measure	1	2
2	The Language of	- Analysis, Determination, Measurement	2	2

	Analytical Chemistry	- Techniques, Methods, procedures, protocols -Statistical Handling of Data (mean, median, range, accuracy, precision, Relative and absolute error, standard deviation & coefficient of variation) - Errors in chemical analysis		
3	Basic Tools of Analytical Chemistry	- Concentration units (normality, molality, w/w %, w/v%, v/v%, ppm ,ppb) and conversion between concentration units - Stoichiometric calculations	3, 4	4
4	Volumetric Analysis	- Requirements, Terms and Definitions - Titration, primary standard, standard solution, standardization, titration curves, equivalence point, end point, titration error and indicators) - Types of reactions in volumetric analysis -Types of titrations	5	2
5	Neutralization titrations	- Solutions: definitions and types. -Acid and Base theories - Chemical equilibrium and equilibrium constant - Ka, pKa and Kw calculations - pH calculations - Acid and Base titration, indicators - Titration curves - Aqueous and non-aqueous titrations - Analytical applications	6, 7	4
6	Med term Exam		8	2
7		- Buffer solutions: definition, buffer capacity, - pH calculation and preparation of buffers - Physiological buffers - Henderson -Hasselbalch equation - Analytical applications	9	2
8	Precipitation titrations	- Precipitation Reaction, Solubility and Ksp. - Precipitation titrations; requirements and argentimetric titration curves. - Volhard's method, Fajan's method and Mohr's method - Analytical applications	10	2
9	Complexometric titrations	- The concept of complexation reaction and stability constant.	11	2

		-Ligands definition and characterization, examples. - EDTA as a ligand.		
10		-Titration curves; problems and indicators. - Titration methodologies, Masking agents and selectivity of EDTA	12	2
11	Oxidation- Reduction titrations (Redox)	- Redox half cell reactions - Calculating oxidation number - Balancing redox reactions - Electrochemical cells: Galvanic, electrolytic, reversible and irreversible cells, schematic representation of cells	13	2
12		-Standard Electrode potential and cell potential - Nernst equation. - Applications: pH-determination, concentration cells and determination of equilibrium constant -Some common reducing and oxidizing agents. - Redox titrations - Analytical applications	14	2
13	Gravimetric Analysis	- Basic concepts -Properties of precipitates and precipitating agents. - Analytical applications	15	2
14	Final Exam		16	2
Number of Weeks /and Units Per Semester			**16**	**32**

B - Practical Aspect:

Order	Topics List	Week Due	contact hours
1	Introduction, laboratory safety and orientation	**1**	**2**
2	Preparation of solutions: Handling of balances and volumetric glassware (preparation of 0.1 M NaCl and 0.1 M HCl	**2**	**2**
3	Standardization of 0.1N HCl Determination of carbonate and bicarbonate in a mixture.	**3**	**2**
4	Determination of aspirin (Back titration) .	**4**	**2**
5	Non aqueous titrations: -Standardization of 0.1M perchloric acid -Determination of metronidazole by non aqueous titration.	**5**	**2**

6	Precipitation Titrations: - Determination of sodium chloride (Mohr's method) - Determination of bromide (Volhard's method) - Determination of a mixture of chloride and iodide (Fajan's method)	**6, 7**	**4**
8	Complexometric titrations with EDTA: - Determination of magnesium sulfate - Determination of calcium chloride -Determination of calcium and magnesium in a mixture	**8, 9**	**4**
9	Redox titrations: - Standardization of potassium permanganate - Determination of ferrous sulfate	**10**	**2**
10	- Standardization of 0.1M iodine - Determination of mixture of iodine and potassium iodide - Determination of ascorbic acid	**11, 12**	**4**
11	Gravimetric analysis: Determination of calcium as calcium oxalate monohydrate	**13**	**2**
12	Final Exam	**14**	**2**
Number of Weeks /and Units Per Semester		**14**	**28**

VII. Teaching strategies of the course:

- Lectures
- Interactive class discussions
- Practical sessions
- Assignments
- Case study
- Web-based study
- Problem- solving

VIII. Assignments:

No	Assignments	Week Due	Mark
1	Homework Assignments	3,6,9,12	5

IX. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment
1	Homework / Tasks/Assignments	3,6,9,12	5	5%
2	Quiz	4	5	5%
3	Mid-term Exam	8	10	10%
4	Practical lab work	Every week	10	10%
5	Final Practical Exam	14	30	30%
6	Final theoretical Exam	16	40	40%
	Total		100	100%

X. Learning Resources:

1- Required Textbook(s) (maximum two).

1- Donald West, F. James Holler, Douglas A. Skoog, Stanley R. Crouch, 2014, Fundamentals of Analytical Chemistry (Brooks/Cole – Thomson Learning), 9th edition.
2- D.A. Skoog, D.M. West, F.J. Holler and S.R. Crouch, 2004, Fundamentals of Analytical Chemistry Brooks/Cole ' 8ed .

2- Essential References.

1- Gary D. Christian, Purnendu K. Dasgupta and Kevin A. Schug, 2014 (Analytical Chemistry), 7th edition, WILEY.
2 - Daniel C. Harris, 2007, (Quantitative Chemical Analysis), 7th edition, (W. H. Freeman and Comp
3 - Douglas A. Skoog, Donald M. West, F. James Holler and Stanely R. Crouch, 2000, (Analytical Chemistry: An Introduction), 7th edition , (Saunders Golden Sunburst series).

3- Electronic Materials and Web Sites *etc*.

6. http://www.chemweb.com
7. http://www.sciencedirect.com
8. http://www.rsc.org
9. http://www.iingroups.com/idl(springer)
10. http://www.4chem.com/vb3

XI. Course Policies:

1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam.
2	**Tardy:**

	- any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** - Assignments and projects will be assessed individually unless the teacher request for group work.
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course.
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:**

Course Specification of Physiology (2)

I. Course Identification and General Information:

1	Course Title:	Physiology (2)				
2	Course Code & Number:	PHA225				
3	Credit hours:	C.H				TOTAL
		Th.	Seminar	practical	Training.	
		2				2
4	Study level/ semester at which this course is offered:	Second year , second Semester				
5	Pre –requisite (if any):	Physiology 1				
6	Co –requisite (if any):	None				
7	Program (s) in which the course is offered:	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	Language of teaching the course:	English				
9	Study System	Semester				
10	Mode of delivery:	Regular				
11	Location of teaching the course:	University campus				
12	Prepared By:	Dr mansoor al khulaidi				

II. Course Description:

This course is a continuation of Human Physiology 1. The course will cover a selection of the following topics: Neurophysiology, endocrine, GIT, reproduction and Renal physiology. The course is pharmaceutically-directed to prepare pharmacy student for better understanding of pathophysiological basis and the mechanism of drug action.

III. Course Objectives:

1- Students should be able to explain interrelationships among molecular, cellular, tissue and organ functions in each system.
2- Students should be able to understand the physiological anatomy of the nervous system.
3- Students should be able to understand the physiological aspects of endocrine, reproductive and gastrointestinal systems.
4- The students should be able to describe mechanisms of hormones for more understanding of drug action in pharmacology.
5- Students should be able to identify functional structures of the renal system.

IV. Course Intended learning outcomes (CILOs) of the course		WRITE Symbol and number of PILOs
a.1	Identify the functional organization and structure of each major organ and body system considered within the course (the central nervous, endocrine, reproductive, renal and the gastrointestinal systems).	A1
a.2	Discuss the integration between the nervous, endocrine and renal systems to maintain homeostasis.	A3
b.1	Apply the learned physiological information in understanding of pharmacology.	B1
b.2	Distinguish a physiological from a pathophysiological condition.	B3
c.1	Advice the patients about their dosage regimen based on the physiological changes.	C2
d.1	Communicate effectively with others.	D1
d.2	Retrieve information about physiology of different body systems	D3

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1- Identify the functional organization and structure of each major organ and body system considered within the course (the central nervous, endocrine, reproductive, renal and the gastrointestinal systems).	Lectures, Watching videos, Group discussion, Seminar.	Assignments, written exam. Continuous evaluation.
a2- Discuss the integration between the nervous, endocrine and renal systems to maintain homeostasis	Lectures, Watching videos, Group discussion, Seminar.	Assignments, written exam. Continuous evaluation.

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1- Apply the learned physiological information in understanding of	Lectures, Group discussion, Problem-	Assignments, written exam. Problem solving exercises.

pharmacology.	based learning	
b2- Distinguish a physiological from a pathophysiological condition.	Lectures, Group discussion, Problem-based learning.	Assignments, written exam. Problem solving exercises.

(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1- Advice the patients about their dosage regimen based on the physiological changes.	Lectures, Group discussion, Problem-based learning.	Problem solving exercises, reports

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1- Communicate effectively with others..	Group discussion Cooperative Learning Seminar	Observation, Presentation, Assignments, reports
d2- Retrieve information about physiology of different body systems	Self learning, Seminar	Presentation, Assignments, reports

V. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	contact hours
1	**CENTRAL NERVOUS SYSTEM-1**	a.1-a2, b1-b2	Cerebrum: Cerebral cortex (Electroencephalogram, Sleep); Basal nuclei; Cerebral lateralization; Language; Limbic system and Emotion.	1	2
2	**CENTRAL NERVOUS SYSTEM-2**	a.1-a2, b1-b2	Diencephalon: Thalamus and Epithalamus; Hypothalamus and Pituitary gland (Regulation of Autonomic system; regulation of circadian rhythms).	1	2
3	**CENTRAL NERVOUS SYSTEM-3**	a.1-a2, b1-b2	Midbrain and Hindbrain: Midbrain; Hindbrain; Reticular Activating System in Sleep and	1	2

			Arousal. Spinal cord tracts: Ascending tracts; Descending tracts.		
4	**SENSORY PHYSIOLOGY**	a.1-a2, b1-b2	Vestibular Apparatus & Equilibrium: Sensory hair cells of the Vestibular apparatus; Utricle & Saccule; Semicircular canals; Neural pathways for equilibrium and balance. The Ears & Hearing: Outer Ear; Middle Ear; Cochlea; Spiral organ (Organ of Corti); Neural pathways for hearing. The Eyes and Vision: Refraction; Accommodation; Visual acuity. Retina: Effect of light on the rods; Electrical activity of retinal cells; Cones & color vision; Visual acuity & sensitivity.	1	2
5	**DIGESTIVE SYSTEM-1**	a.1-a2, b1-b2,	Introduction to the digestive system; Layers of the gastrointestinal tract (GIT); Regulation of the GIT. From mouth to stomach: Esophagus: Stomach; Pepsin and HCl secretion.	1	2
6	**DIGESTIVE SYSTEM-2**	a.1-a2, b1-b2	Small intestine: Villi and Microvilli; Intestinal Enzymes; Intestinal contractions and Motility. Large intestine: Intestinal Microbiota; Fluid and Electrolyte Absorption in the Intestine; Defecation. Liver: Structure of the Liver;	1	2
7	**DIGESTIVE SYSTEM-3**	a.1-a2, b1-b2	Functions of the Liver; parts and functions; Pancreas. Regulation of the digestive System: Regulation of the Gastric Function; Regulation of Intestinal Function, Regulation of Pancreatic Juice and Bile Secretion; Trophic effects of Gastrointestinal Hormones.	1	2
8	Midterm exam	a.1-a2, b1-b2, d1		1	2
9	**ENDOCRINE**	a.1-a2,	Endocrine Glands and Hormones:	1	2

	SYSTEM-1	b1-b2, c1	Chemical classification of Hormones; Hormone interactions. Mechanism of Hormone Action: Hormones that bind to Nuclear Receptor Proteins; Hormones that use second messengers.		
10	**ENDOCRINE SYSTEM-2**	a.1-a2, b1-b2, c1, d1-d2	Pituitary gland: Pituitary hormones; Hypothalamic control of the Posterior Pituitary; Hypothalamic control of the Anterior Pituitary; Feedback control of the Anterior Pituitary.	1	2
11	**ENDOCRINE SYSTEM-3**	a.1-a2, b1-b2, c1, d1-d2	Adrenal glands: Functions of the adrenal Cortex; Functions of Adrenal Medulla; Stress & the Adrenal gland. Thyroid & Parathyroid Glands: Production & action of thyroid hormones; Parathyroid gland.	1	2
12	**PHYSIOLOGY OF THE KIDNEYS-1**	a.1-a2, b1-b2, c1, d1-d2	Structure & function of the Kidneys: Gross Structure of the urinary system; Control of Micturition; Microscopic Structure of the Kidney (Nephron tubules). Glomerular Filtration: Glomerular Ultrafiltrate; Regulation of Glomerular Filtration rate.	1	2
13	**PHYSIOLOGY OF THE KIDNEYS-2**	a.1-a2, b1-b2, c1, d1-d2	Reabsorption of Salt & Water: Reabsorption in the proximal tubule; The Countercurrent multiplier system (Ascending & Descending limbs of Henle loop; Vasa recta); Collecting duct: Effect of ADH. Renal Plasma Clearance: Transport process affecting renal clearance (Tubular secretion of drugs); Reabsorption of Glucose (Glycosuria). Renal control of Electrolyte & Acid-base balance: Role of Aldosterone in Na+/K+ balance (Sodium reabsorption, Potassium ecretion).	1	2
14	**PHYSIOLOGY OF THE KIDNEYS-3**	a.1-a2, b1-b2, c1,	Control of Aldosterone Secretion; Juxtaglomerular Apparatus	1	2

		d1-d2	(Control of Renin secretion; Role of the macula densa); Natriuretic Peptides; Relationship between Na+, K+, and H+; Renal Acid-Base Regulation (Reabsorption of bicarbonate and secretion of H+; Urinary buffers).		
15	**REPRODUCTION**	a.1-a, b1-b2, c1, d1-d2	Male reproductive system: Control of gonadotropin secretion (Testosterone derivatives; Testosterone secretion & age); Endocrine functions of the Testes; Male Accessory Sex Organs; Erection, Emission & ejaculation; Male fertility. Female Reproductive System: Ovarian cycle; Ovulation; Pituitary-ovarian axis. Menstrual cycle: Phases of the Menstrual Cycle: Cyclic changes in the Ovaries (Follicular phase; Ovulation; Luteal phase); Cyclic changes in the Endometrium; Menopause.	1	2
16	**Final examination**	a.1-a2, b1-b2, d1,d2		1	2
Number of Weeks /and Units Per Semester				**16**	**32**

VI. Teaching strategies of the course:

Lectures, Watching videos.
Group discussion.
Seminar
Problem-based learning
Cooperative Learning
Self learning

VII. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Home works assignments	a.1-a2, b1-b2, c1, d1-d2	Continually	5
2				

VIII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Home works assignments	Continually	5	5%	a.1-a2, b1-b2, c1, d1-d2
2	Class Activities	Continually	5	5%	a.1-a2, b1-b2, c1, d1-d2
3	Mid-term exam	8th week	20	20%	a.1-a2, b1-b2, d1
4	Final exam	16th week	70	70 %	a.1-a4, b1-b2, d1
5	**Total**		**100**	**100%**	

IX. Learning Resources:

1- Required Textbook(s) (maximum two).

1- Stuart Ira Fox. 2016. Human Physiology, 14th edition, McGraw Hill.

2- Marieb E.N. (2015). Essentials of Human Anatomy and physiology, 11th edition, Pearson Education, Inc.

2- Essential References.

1- Gerard J. Tortora and Bryan H. Derrickson (2012). Principles of Anatomy and Physiology, 13th edition, Wiley and Sons, Inc.

2- Guyton and Hall Textbook of Medical Physiology, 13th Edition (Guyton Physiology), John E. Hall. 2012

3- Ganong's Review of Medical Physiology, 24th Edition (LANGE Basic Science) 24th Edition by Kim E. Barrett, Susan M. Barman, Scott Boitano, Heddwen Brooks.

3- Electronic Materials and Web Sites *etc*.

1- https://www.udemy.com/course/physiology/
2- https://www.physiologyweb.com/
3- https://www.physiology.org/

X. Course Policies:	
1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects**: - Assignments and projects will be assessed individually unless the teacher request for group work
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the faculty rules.
7	**Other policies**: -

Template for Course Plan (Syllabus) Physiology 2

I. Information about Faculty Member Responsible for the Course:

		Office Hours					
Name of Faculty Member							
Location& Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Identification and General Information:

1	Course Title:	Physiology 2				
2	Course Number & Code:	PHA225				
3	Credit hours:	C.H				Total
		Th.	Seminar	Pr.	F. Tr.	
		2				2
4	Study level/year at which this course is offered:	Second year/ second semester				
5	Pre –requisite (if any):	Physiology (1)				
6	Co –requisite (if any):	None				
7	Program (s) in which the course is offered	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	Language of teaching the course:	English				
9	System of Study:	Semester				
10	Mode of delivery:	Regular				
11	Location of teaching the course:	University campus				

IV. Course Description:

This course is a continuation of Human Physiology 1. The course will cover a selection of the following topics: Neurophysiology, endocrine, GIT, reproduction and Renal physiology. The course is pharmaceutically-directed to prepare pharmacy student for better understanding of pathophysiological basis and the mechanism of drug action.

V. Course Objectives:

1- Students should be able to explain interrelationships among molecular, cellular, tissue and organ functions in each system.

2- Students should be able to understand the physiological anatomy of the nervous system.

3- Students should be able to understand the physiological aspects of endocrine, reproductive and gastrointestinal systems.

4- The students should be able to describe mechanisms of hormones for more understanding of drug action in pharmacology.

5- Students should be able to identify functional structures of the renal system.

VI. Intended learning outcomes (ILOs) of the course:

Identify the functional organization and structure of each major organ and body system considered within the course (the central nervous, endocrine, reproductive, renal and the gastrointestinal systems).
Discuss the integration between the nervous, endocrine and renal systems to maintain homeostasis.
Apply the learned physiological information in understanding of pharmacology.
Distinguish a physiological from a pathophysiological condition.
Advice the patients about their dosage regimen based on the physiological changes.
Communicate effectively with others.
Retrieve information about physiology of different body systems

VII. Course Content:

- Distribution of Semester Weekly Plan of Course Topics/Items and Activities.

A – Theoretical Aspect:

Order	Topics List	Week Due	Contact Hours
1	**CENTRAL NERVOUS SYSTEM**1 Cerebrum: Cerebral cortex (Electroencephalogram, Sleep); Basal nuclei; Cerebral lateralization; Language; Limbic system and Emotion.	1	2

2	**CENTRAL NERVOUS SYSTEM**2 Diencephalon: Thalamus and Epithalamus; Hypothalamus and Pituitary gland (Regulation of Autonomic system; regulation of circadian rhythms).	2	2
3	**CENTRAL NERVOUS SYSTEM**3 Midbrain and Hindbrain: Midbrain; Hindbrain; Reticular Activating System in Sleep and Arousal. Spinal cord tracts: Ascending tracts; Descending tracts.	3	2
4	**SENSORY PHYSIOLOGY** Vestibular Apparatus & Equilibrium: Sensory hair cells of the Vestibular apparatus; Utricle & Saccule; Semicircular canals; Neural pathways for equilibrium and balance. The Ears & Hearing: Outer Ear; Middle Ear; Cochlea; Spiral organ (Organ of Corti); Neural pathways for hearing. The Eyes and Vision: Refraction; Accommodation; Visual acuity.	4	2
5	**DIGESTIVE SYSTEM**1 Introduction to the digestive system; Layers of the gastrointestinal tract (GIT); Regulation of the GIT. From mouth to stomach: Esophagus: Stomach; Pepsin and HCl secretion.	5	2
6	**DIGESTIVE SYSTEM**2 Small intestine: Villi and Microvilli; Intestinal Enzymes; Intestinal contractions and Motility. Large intestine: Intestinal Microbiota; Fluid and Electrolyte Absorption in the Intestine; Defecation. Liver: Structure of the Liver;	6	2
7	**DIGESTIVE SYSTEM**3 Functions of the Liver; parts and functions; Pancreas. Regulation of the digestive System: Regulation of the Gastric Function; Regulation of Intestinal Function, Regulation of Pancreatic Juice and Bile Secretion; Trophic effects of Gastrointestinal Hormones.	7	2
8	**Midterm exam**	8	2
9	**ENDOCRINE SYSTEM**1 Endocrine Glands and Hormones: Chemical classification of Hormones; Hormone interactions. Mechanism of Hormone Action: Hormones that bind to Nuclear Receptor Proteins; Hormones that use second messengers.	9	2
10	**ENDOCRINE SYSTEM2** Pituitary gland: Pituitary hormones; Hypothalamic control of the Posterior Pituitary; Hypothalamic control of the Anterior Pituitary; Feedback control of the Anterior Pituitary.	10	2
11	**ENDOCRINE SYSTEM3** Adrenal glands: Functions of the adrenal Cortex; Functions of Adrenal Medulla; Stress & the Adrenal gland. Thyroid & Parathyroid Glands: Production & action of thyroid hormones; Parathyroid gland	11	2

12	**PHYSIOLOGY OF THE KIDNEYS**1 Structure & function of the Kidneys: Gross Structure of the urinary system; Control of Micturition; Microscopic Structure of the Kidney (Nephron tubules). Glomerular Filtration: Glomerular Ultrafiltrate; Regulation of Glomerular Filtration rate.	12	2
13	**PHYSIOLOGY OF THE KIDNEYS**2 Reabsorption of Salt & Water: Reabsorption in the proximal tubule; The Countercurrent multiplier system (Ascending & Descending limbs of Henle loop; Vasa recta); Collecting duct: Effect of ADH. Renal Plasma Clearance: Transport process affecting renal clearance (Tubular secretion of drugs); Reabsorption of Glucose (Glycosuria). Renal control of Electrolyte & Acid-base balance: Role of Aldosterone in Na+/K+ balance (Sodium reabsorption, Potassium ecretion).	13	2
14	**PHYSIOLOGY OF THE KIDNEYS**3 Control of Aldosterone Secretion; Juxtaglomerular Apparatus (Control of Renin secretion; Role of the macula densa); Natriuretic Peptides; Relationship between Na+, K+, and H+; Renal Acid-Base Regulation (Reabsorption of bicarbonate and secretion of H+; Urinary buffers).	14	2
15	**REPRODUCTION** Male reproductive system: Control of gonadotropin secretion (Testosterone derivatives; Testosterone secretion & age); Endocrine functions of the Testes; Male Accessory Sex Organs; Erection, Emission & ejaculation; Male fertility. Female Reproductive System: Ovarian cycle; Ovulation; Pituitary-ovarian axis. Menstrual cycle: Phases of the Menstrual Cycle: Cyclic changes in the Ovaries (Follicular phase; Ovulation; Luteal phase); Cyclic changes in the Endometrium; Menopause.	15	2
16	**Final examination**	16	2
Number of Weeks /and Units Per Semester		**16**	**32**

VIII. Teaching strategies of the course:

Lectures, Watching videos.
Group discussion.
Seminar
Problem-based learning
Cooperative Learning
Self learning

IX. Assignments:

No	Assignments	Week Due	Mark
1	Home works assignments	Continually	5

X. Schedule of Assessment Tasks for Students During the Semester:

Assessment	Type of Assessment Tasks	Week Due	Mark	Proportion of Final Assessment
1	Home works assignments	Continually	5	5%
2	Class Activities	Continually	5	5%
3	Mid-term exam	8th week	20	20%
4	Final exam	16th week	70	70 %
5	Total		100	100%

XI. Learning Resources:

1- Required Textbook(s) (maximum two).

1- Stuart Ira Fox. 2016. Human Physiology, 14th edition, McGraw Hill.

2- Marieb E.N. (2015). Essentials of Human Anatomy and physiology, 11th edition, Pearson Education, Inc.

2- Essential References.

1- Gerard J. Tortora and Bryan H. Derrickson (2012). Principles of Anatomy and Physiology, 13th edition, Wiley and Sons, Inc.
2-Guyton and Hall Textbook of Medical Physiology, 13th Edition (Guyton Physiology), John E. Hall. 2012
3-Ganong's Review of Medical Physiology, 24th Edition (LANGE Basic Science) 24th Edition by Kim E. Barrett, Susan M. Barman, Scott Boitano, Heddwen Brooks

3- Electronic Materials and Web Sites *etc*.

1- https://www.udemy.com/course/physiology/
2- https://www.physiologyweb.com/
3- https://www.physiology.org/

XII.	Course Policies:
1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam.
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** - Assignments and projects will be assessed individually unless the teacher request for group work.
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course.
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:**

Course Specification of Pharmaceutical Organic Chemistry

I. Course Identification and General Information:

1	**Course Title:**	**Pharmaceutical Organic Chemistry**				
2	**Course Code & Number:**	**PHA231**				
3	**Credit hours:**	C.H				TOTAL
		Th.	Seminar	practical	Training.	
		2	-	1	-	**3**
4	**Study level/ semester at which this course is offered:**	Second Year / Second Semester				
5	**Pre –requisite (if any):**	**Organic Chemistry**				
6	**Co –requisite (if any):**	**None**				
7	**Program (s) in which the course is offered:**	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	**Language of teaching the course:**	**English**				
9	**Study System**	Semester				
10	**Mode of delivery:**	**Regular**				
11	**Location of teaching the course:**	**University campus**				
12	**Prepared By:**	**Prof. Dr. Abdullah A. Alkarim Al-Shara´ey**				

II. Course Description:

This course is concerned with studying organic chemistry of important aromatic and heterocyclic compounds, it includes: aromatic compounds, benzene and its homologues, electrophilic aromatic substitution, nucleophlic aromatic substitution, aryl Halides, polynuclear hydrocarbons, aromatic nitro compounds, aromatic amino compounds, aromatic diazonium salts, phenols, aromatic sulfonic acids, aromatic aldehydes and ketones and aromatic acids. Heterocyclic chemistry: five-membered and six-membered heterocyclic. Their chemical properties, synthesis, reactivity and reactions. The students also will be able to apply knowledge in performing some basic laboratory experiments.

III. Course Objectives:

The course aims to enable students to:

- Define and classify the aromatic and heterocyclic organic compounds.
- Use the (IUPAC) rule and suitable name for aromatic organic compounds
- Provide students with proper understanding of the basic principles of aromaticity and heterocyclic chemistry
- Understand the basic principles of organic reactions and synthesis
- Choose the suitable methods to organic synthesize certain organic compounds and their physicochemical properties
- Recognize the physical and chemical properties for aromatic and heterocyclic organic compounds
- Use the lab equipment, chemical, solvents to synthesis some important of organic compound and determine their physical and chemical properties

IV.	Course Intended learning outcomes (CILOs) of the course	WRITE Symbol and number of PILOs
a.1	Define and classify the aromatic and heterocyclic organic compounds.	**A2**
a.2	Represent various structural and molecular formulas of different aromatic and heterocyclic organic compounds.	**A3**
a.3	Identify different aromatic organic and heterocyclic functionalities, their properties and transformation to each other	**A3**
b.1	Predict the IUPAC name for aromatic and heterocyclic organic compounds.	**B1**
b.2	Design appropriate methods for synthesis and purification of selected aromatic and heterocyclic compounds.	**B2**
c.1	Determine the physicochemical characteristics of different aromatic and heterocyclic organic compounds.	**C1**
c.2	Perform chemical synthesis of selected aromatic and heterocyclic organic compounds effectively and safely.	**C1**
d.1	Defend in a scientific way during the discussion of the lab report.	**D3**

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1- Define and classify the aromatic and heterocyclic organic compounds.	- lecture (Material presentation, illustration with examples and discussion). - Problem analysis and problem solving	- Quizzes - Written exam - Practical work - Assignments
a2- Represent various structural and molecular formulas of different aromatic and heterocyclic organic compounds.		
a3- Identify different aromatic organic and heterocyclic functionalities, their properties and transformation to each other		

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1- Predict the IUPAC name for aromatic and heterocyclic organic compounds.	-Lectures - Practical interaction - Lab discussions - Literature analysis	- Quizzes - Written exam - Problem solving
b2- Design appropriate methods for synthesis and purification of selected aromatic and heterocyclic compounds.		

(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1- Determine the physicochemical characteristics of different aromatic and heterocyclic organic compounds.	- Practical work material - Practical problem Solution - Individual student work	Practical assessment and lab reports
c2- Determine the physicochemical characteristics of different aromatic and heterocyclic organic compounds.		
c3- Perform chemical synthesis of selected aromatic and heterocyclic organic compounds effectively and safely.		

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1- Defend the scientific way during the discussion of the lab report.	- Practical - Information analysis - Lab report discussions	- Practical assessment and discussion lab reports

V. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	contact hours
1	Aromatic organic compounds:	a1-a3 b1	Classification of aromatic compounds	1	2
			Structure of benzene and the concept of aromaticity		
			Nomenclature of benzene derivatives		
			Electrophilic Aromatic Substitution		
2	Further substitution in benzene ring and polynuclear aromatic compounds		Reactivity and Orientation	1	2
			Synthesis and reactions derivatives of benzene		
			Nomenclature and reaction of polynuclear aromatic hydrocarbons		
3	Aryl Halides		Definition and nomenclature	1	2
			Structure and physical properties		
			Synthesis		
			Nucleophlic aromatic substitution		
4	Aromatic Nitro Compounds		Definition and nomenclature	1	2
			Structure and nomenclature		
			Physical properties		
			Synthesis and reactions		

5	Aromatic amines		Definition and classification Structure and nomenclature Physical properties and basicity concept Synthesis and reactions	**1**	2
6	Aromatic diazonium salts		Definition and classification Structure, Nomenclature and stability Physical properties Synthesis -Reactions with retaining of nitrogen [coupling reduction] -Reactions with replacement of nitrogen[by hydrogen, OH, Cl or Br (Sandmeyer reaction, gattermann reaction), Schiemann reaction, CN, NO_2.	**1**	2
7	**Mid-Term exam**	a1-a3 b1, b2 d1.		**1**	2
8	Phenols	a1-a3 b1, b2	Definition and classification Structure and nomenclature Physical properties and acidity concept Synthesis Reactions and Pharmaceutical importance of phenols.	**1**	2
9	Aromatic sulfonic acids		Structure, nomenclature and physical properties Synthesis and Reactions Pharmaceutical importance of Aromatic sulfonic acid and their derivatives [Chloramines T, Dichloramine T, Saccharine and Sulfonamides].	**1**	2
10	Aromatic Aldehydes and Ketones		Structure and nomenclature physical properties Synthesis	**1**	2

			Reactions (nucleophilic addition, oxidation-reduction and condensations)		
11	Aromatic carboxylic acids and their derivatives (acid halides, anhydride, esters, amides and nitriles)		Structure and nomenclature	**1**	2
			Physical properties and acidity concept Physical Properties of carboxylic acids derivatives		
			Synthesis		
			Reactions		
			Saturated, unsaturated and aromatic dicarboxylic acid		
12	Heterocyclic organic compounds -Five membered ring		Structure and definition	**1**	2
			Nomenclature and reactivity		
			Synthesis and reactions of pyrrole, thiophen and furan		
			Synthesis and reactions of indole, benzothiophene and benzofuran		
13	Heterocyclic organic compounds -Six membered ring	a1-a3 b1, b2	Structure and definition	**1**	2
			Nomenclature and reactivity		
			Synthesis and reactions of pyridine, quinoline and isoquinoline		
			Synthesis and Reactions of pyridazine, pyrimidine and pyrazine.		
14	General Revision		General revision about the above subjects	**1**	2
15	**Final Exam**	a1-a3 b1, b2 d1.		**1**	2
Number of Weeks /and Units Per Semester				**15**	**30**

B - Practical Aspect:

Order	Tasks/ Experiments	Number of Weeks	contact hours	Learning Outcomes
1	Lab safety and lab equipment	1	2	c1,c2
2	Synthesis of ethyl acetate	1	2	a4,a2; b2-b2; c1, d1
3	Synthesis of methyl salicylate	1	2	
4	Synthesis of acetanilide	1	2	
5	Synthesis of iodoform	1	2	
6	Synthesis of nitrotoluene	1	2	
7	Mid-Term exam	1	2	a1; b2; c1, c2, d1
8	Synthesis of nitronaphthalene	1	2	a1; b2; c1, c2, d1
9	Synthesis of azodye	1	2	
10	Synthesis of diazoaminobenzene	1	2	
11	Synthesis of ozazone	1	2	a1; b2; c1, c2, d1
12	Revision	1	2	
13	Practical Exam	1	2	a1;a2 b1,b2; c1, c2, d1
Number of Weeks /and Units Per Semester		13	26	

VI. Teaching strategies of the course:

- Lecture (material presentation, illustration with examples and discussion.
- Problem analysis and problems' solution.
- Explanation and consulting.
- Practical work material, practical problem solution, individual student's work.

No	Assignments	Week Due	Mark
1	**Participation, assignments, problem solving and quizzes**	3-12 w	10

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment
1	**Participation, assignments, problem solving and quizzes**	3-12 w	10	10 %

2	**Midterm exam**	7 W	10	10 %
3	**Final exam (theoretical)**	15 W	40	40 %
4	**Practical work**	2-12 W	10	10 %
5	**Final exam (practical) and lab report**	13 W	30	30 %
7	**Total**		**100**	**100 %**

VII. Learning Resources:

	1- Organic Chemistry, A Short Course, Dived J. Hart; Christopher M. Hadad; Leslie E. Craine Harold Hart. Cengage Learning 2010. 2- Heterocyclic Chemistry, J. A. Joule, K. Mills, 5th Ed., 2010.
2- Essential References.	
	1- Organic Chemistry, T. W. Graham Solomons, Craig B. Fryhle, and Scott A. Snyder11th Ed., 2014. 2- Organic Chemistry, Textbook Website; Francis A. Carey; McGraw-Hill, 2001 3- A Microscale Approach to Organic Laboratory Techniques, Donald L. Pavia, Gary M. Lampman, George S. Kriz, Randall G. Engel, 4th Ed., 2016
3- Electronic Materials and Web Sites *etc*.	
	1- Power Point Presentation (PPT and /or Pdf) Slides for Lectures Delivery.

VIII. Course Policies:

1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be

	allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects**: - Assignments and projects will be assessed individually unless the teacher request for group work
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the faculty rules.
7	**Other policies**: -

Template for Course Plan (Syllabus) of Pharmaceutical Organic Chemistry

I. - Information about Faculty Member Responsible for the Course:

		Office Hours					
Name of Faculty Member							
Location& Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Identification and General Information:

1	Course Title:	Pharmaceutical Organic Chemistry				
2	Course Number & Code:	PHA231				
3	Credit hours:	C.H				Total
		Th.	Seminar	Pr.	F. Tr.	
		2	-	1	-	3
4	Study level/year at which this course is offered:	Second year / Second Semester				
5	Pre –requisite (if any):	Organic Chemistry				
6	Co –requisite (if any):					
7	Program (s) in which the course is offered	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	Language of teaching the course:	English				
9	System of Study:	Semester				
10	Mode of delivery:	Regular				
11	Location of teaching the course:	University campus				

III. Course Description:

This course is concerned with studying organic chemistry of important aromatic and heterocyclic compounds, it includes: aromatic compounds, benzene and its homologues, electrophilic aromatic substitution, nucleophlic aromatic substitution, aryl Halides, polynuclear hydrocarbons, aromatic nitro compounds, aromatic amino compounds, aromatic diazonium salts, phenols, aromatic sulfonic acids, aromatic aldehydes and ketones and aromatic acids. Heterocyclic chemistry: five-membered and six-membered heterocyclic. Their chemical properties, synthesis, reactivity and reactions. The students also will be able to apply knowledge in performing some basic laboratory experiments.

IV. Course Objectives:

The course aims to enable students to:

- Define and classify the aromatic and heterocyclic organic compounds.
- Use the (IUPAC) rule and suitable name for aromatic organic compounds
- Provide students with proper understanding of the basic principles of aromaticity and heterocyclic chemistry
- Understand of the basic principles of organic reactions and synthesis
- Choose the suitable methods to organic synthesize certain organic compounds and their physicochemical properties
- Recognize the physical and chemical properties for aromatic and heterocyclic organic compounds
- Use the lab equipment, chemical, solvents to synthesis some important of organic compound and determine their physical and chemical properties.

V. Intended learning outcomes (ILOs) of the course:

- Define and classify the aromatic and heterocyclic organic compounds.
- Represent various structural and molecular formulas of different aromatic and heterocyclic organic compounds.
- Identify different aromatic organic and heterocyclic functionalities, their properties and transformation to each other
- Predict the IUPAC name for aromatic and heterocyclic organic compounds.
- Design appropriate methods for synthesis and purification of selected aromatic and heterocyclic compounds.
- Determine the physicochemical characteristics of different aromatic and heterocyclic organic compounds.
- Perform chemical synthesis of selected aromatic and heterocyclic organic compounds effectively and safely.
- Defend in a scientific way during the discussion of the lab report.

VI. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Sub Topics List	Number of Weeks	contact hours
1		Classification of aromatic compounds		2

	Aromatic organic compounds:	Structure of benzene and the concept of aromaticity Nomenclature of benzene derivatives Electrophilic Aromatic Substitution	**1**	
2	Further substitution in benzene ring and polynuclear aromatic compounds	Reactivity and Orientation Synthesis and reactions derivatives of benzene Nomenclature and reaction of polynuclear aromatic hydrocarbons	**2**	2
3	Aryl Halides	Definition and nomenclature Structure and physical properties Synthesis Nucleophlic aromatic substitution	**3**	2
4	Aromatic Nitro Compounds	Definition and nomenclature Structure and nomenclature Physical properties Synthesis and reactions	**4**	2
5	Aromatic amines	Definition and classification Structure and nomenclature Physical properties and basicity concept Synthesis and reactions	**5**	2
6	Aromatic diazonium salts	Definition and classification Structure, Nomenclature and stability Physical properties Synthesis -Reactions with retaining of nitrogen [coupling reduction] -Reactions with replacement of nitrogen [by hydrogen, OH, Cl or Br (Sandmeyer reaction, gattermann reaction), Schiemann reaction, CN, NO_2.	**6**	2
7	**Mid-Term exam**		**7**	2
8	Phenols	Definition and classification Structure and nomenclature Physical properties and acidity concept Synthesis	**8**	2

		Reactions and Pharmaceutical importance of phenols.		
9	Aromatic sulfonic acids	Structure, nomenclature and physical properties Synthesis and Reactions Pharmaceutical importance of Aromatic sulfonic acid and their derivatives [Chloramines T, Dichloramine T, Saccharine and Sulfonamides].	**9**	2
10	Aromatic Aldehydes and Ketones	Structure and nomenclature physical properties Synthesis Reactions (nucleophilic addition, oxidation-reduction and condensations)	**10**	2
11	Aromatic carboxylic acids and their derivatives (acid halides, anhydride, esters, amides and nitriles)	Structure and nomenclature Physical properties and acidity concept Physical Properties of carboxylic acids derivatives Synthesis Reactions Saturated, unsaturated and aromatic dicarboxylic acid	**11**	2
12	Heterocyclic organic compounds -Five membered ring	Structure and definition Nomenclature and reactivity Synthesis and reactions of pyrrole, thiophen and furan Synthesis and reactions of indole, benzothiophene and benzofuran	**12**	2
13	Heterocyclic organic compounds -Six membered ring	Structure and definition Nomenclature and reactivity Synthesis and reactions of pyridine, quinoline and isoquinoline Synthesis and Reactions of pyridazine, pyrimidine and pyrazine.	**13**	2
14	General Revision	General revision about the above subjects	**14**	2
15	**Final Exam**		**15**	

Number of Weeks /and Units Per Semester		15	30

B - Practical Aspect:

Order	Tasks/ Experiments	Number of Weeks	contact hours
1	Lab safety and lab equipment	1	2
2	Synthesis of ethyl acetate	2	2
3	Synthesis of methyl salicylate	3	2
4	Synthesis of acetanilide	4	2
5	Synthesis of iodoform	5	2
6	Synthesis of nitrotoluene	6	2
7	Mid-Term exam	7	2
8	Synthesis of nitronaphthalene	8	2
9	Synthesis of azodye	9	2
10	Synthesis of diazoaminobenzene	10	2
11	Synthesis of ozazone	11	2
12	Revision	12	2
13	Practical Exam	13	2
Number of Weeks /and Units Per Semester		13	26

VII. Teaching strategies of the course:

- Lecture (material presentation, illustration with examples and discussion.
- Problem analysis and problems' solution.
- Explanation and consulting
- Practical work material, practical problem solution, individual student's work.

VIII. Assignments:

No	Assignments	Week Due	Mark
1	**Participation, assignments, problem solving and quizzes**	3-12 w	10

IX. Schedule of Assessment Tasks for Students During the Semester:

Assessment	Type of Assessment Tasks	Week Due	Mark	Proportion of Final Assessment
1	Participation, assignments, problem solving and quizzes	3-12 w	10	10 %
2	Midterm exam	7 W	10	10 %
3	Final exam (theoretical)	15 W	40	40 %
4	Practical work	2-12 W	10	10 %
5	Final exam (practical) and lab report	13 W	30	30 %
6	Total		100	100 %

X. Learning Resources:

1- Organic Chemistry, A Short Course, Dived J. Hart; Christopher M. Hadad; Leslie E. Crain and Harold Hart. Cengage Learning 2010.
2- Heterocyclic Chemistry, J. A. Joule, K. Mills, 5th Ed., 2010.

2- Essential References.

1- Organic Chemistry, T. W. Graham Solomons, Craig B. Fryhle, and Scott A. Snyder11th Ed., 2014.
2- Organic Chemistry, Textbook Website; Francis A. Carey; McGraw-Hill, 2001
3- A Microscale Approach to Organic Laboratory Techniques, Donald L. Pavia, Gary M. Lampman, George S. Kriz, Randall G. Engel, 4th Ed., 2016

3- Electronic Materials and Web Sites *etc*.

Power Point Presentation (PPT and /or Pdf) Slides for Lectures Delivery.-1

XI. Course Policies:

1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam.
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:**

	- any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** - Assignments and projects will be assessed individually unless the teacher request for group work.
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course.
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:**

Course Specification of Biochemistry (2)

I. Course Identification and General Information:

1	Course Title:	Biochemistry (2)				
2	Course Code & Number:	PHA242				
3	Credit hours:	C.H				TOTAL
		Th.	Seminar	practical	Training.	
		2	-	1	-	3
4	Study level/ semester at which this course is offered:	Second year second semester				
5	Pre –requisite (if any):	Biochemistry (1)				
6	Co –requisite (if any):	None				
7	Program (s) in which the course is offered:	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	Language of teaching the course:	English				
9	Study System	Semester				
10	Mode of delivery:	Regular				
11	Location of teaching the course:	Al-Saeed University				
12	Prepared By:	Dr. Mufeed A. Baddah				

II. Course Description:

The course is intended to provide students with comprehensive knowledge and clear understanding of the basic concepts of metabolism. The course covers the metabolic pathways of the major biomolecules; carbohydrates, lipids, proteins, both anabolic and catabolic pathways, the regulation of metabolism and the biochemical alteration in health and disease. The course also includes practical part that helps students to perform some biochemical laboratory quantitative analysis.

III. Course Objectives:

On completion of the course, the student will be able to:

1. Understand the major metabolic pathways that take place in human body.
2. Learn the interrelationship between carbohydrates, lipid and protein metabolism.
3. Carry out the biochemical laboratory quantitative analysis for diagnosis of different organs dysfunctions.

IV.	Course Intended learning outcomes (CILOs) of the course	WRITE Symbol and number of PILOs
a.1	Describe carbohydrates, lipids, proteins & amino acids digestion, absorption & transportation.	**A1**
a.2	Discuss blood glucose, lipids (cholesterol & lipoproteins), proteins, amino acids levels & their regulations, biological importance, and usefulness in diagnostic values.	**A1**
a.3	Explain the effect of (cation & anion) as: Ca2+, Na+, K+, and HCO3-, Cl-, etc…, their roles in maintenance of gastric pH & blood pH, in health and disease state. (reaction, regulation, significance & disorders).	**A3**
b.1	Differentiate between various biomolecules metabolic pathways.	**B1**
b.2	Interpret and evaluate normal and abnormal biochemical data.	**B3**
c.1	Perform some biochemical tests and use the results to find abnormal chemical biological values methods of correction.	**C4**
c.2	Carry out laboratory tests and apply the suitable methods for analysis of different biochemical compounds.	**C1, C2**
d.1	Interact and communicate effectively and ethically with teaching staff during the learning process.	**D1**

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1- Describe carbohydrates, lipids, proteins & amino acids digestion, absorption & transportation.	- Lecture - Discussion - Self-learning - Brain storming. - Seminars	- Written exam - Assignments - Continuous evaluation
a2- Discuss blood glucose, lipids (cholesterol & lipoproteins), proteins, amino acids levels & their regulations, biological importance, and usefulness in diagnostic values.		
a3- Explain the effect of (cation & anion) as: Ca2+, Na+, K+, and HCO3-, Cl-, etc…, their roles in maintenance of gastric pH & blood pH, in health and disease state. (reaction, regulation, significance & disorders).		

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1- Differentiate between various biomolecules metabolic pathways. **b2-** Interpret and evaluate normal and abnormal biochemical data.	- Lecture - Discussion - Case studies - Practical classes - Brain storming.	- Written and Practical exams - Assignments - Continuous evaluation - Case studies

(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1- Perform some biochemical tests and use the results to find abnormal chemical biological values methods of correction. **c2-** Carry out laboratory tests and apply the suitable methods for analysis of different biochemical compounds.	- Discussion - Practical classes	- Practical Exams - Practical work assessment - Report

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1- Interact and communicate effectively and ethically with teaching staff during the learning process.	- Discussion - Practical classes - Seminar	- Oral presentation - Observation - Assignments, Report

V. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	contact hours
1	Carbohydrate digestion & metabolism:	a.1,a2	-Glycolysis -Gluconeogenesis -Glycogenesis -Glycogenolysis -Glucouronic pathway -Pentose Phosphate Pathway	4	8

			-Mono saccharides interconvert able -Resulted of metabolic diseases (diabetes mellitus, …etc,)		
2	Dietary lipid digestion & absorption.	a.2, a.2,a.3, b.1	metabolism of lipoproteins, (Chylomicron, Low Density Lipoprotein, High Density Lipoprotein, & the resulted metabolic diseases.	1	2
3	Fatty acids & triglycerides metabolism (synthesis & oxidation "degradation")	a.1,a.2, a.3, b.1-b.2 d.1	-β-Oxidation of fatty acids & energy production. -Fatty acid synthesis & elongations.	3	6
4	Midterm exam	a.1, a.2,a3 b.1-b.2, d.1		1	2
5	Complex lipid metabolism	a.2, a.2, a3 b.1-b.2 d.1	-Phospholipids, -Glycolipids, Cerebroside and Ganglioside degradations	1	2
6	Cholesterol metabolism	a.1, a.2, a.3, b.1-b.2 d.1	-Cholesterol synthesis & degradation -Accumulation (atherosclerosis), -Cholesterol Ester,	1	2
7	Protein digestion & absorption mechanisms.	a.1, a.2, b.1,b.2, d.1	Gastric juice composition. - Formation of Hcl & HCO3 -Simple diffusion -Active transport -Carrier transport	1	2
8	Amino acids metabolism (degradation & synthesis)	a.1, a.2, b.1-b.2 d.1	Transamination & deamination reactions. -Shuttles to transfer the reducing agents produed.	2	4

			- Ammonia production, its fates. -Urea cycle.		
9	Conversion of amino acids to specializes products.	a.1, a.2, a3 b.1-b.2, d.1	Special products from different amino acids & their biological importance	1	2
10	Final exam	a.1, a2,a3,b1,b.2 d.1		1	2
Number of Weeks /and Units Per Semester				**16**	**32**

B - Practical Aspect:

Order	Tasks/ Experiments	Number of Weeks	contact hours	Learning Outcomes
1	-Define the principles of lab. safety & how to deal with the equipment's and glass ware.	1	2	c.1- c.3, d.1
2	Differentiate between serum & plasma. Assay of bilirubin (direct & indirect).	1	2	b.1, c.1- c.2, d.1
3	Assay of blood glucose. GGT-test.	2	4	b.1, c.1- c.2, d.1
4	Assay of blood triglyceride & cholesterol	**1**	**2**	b.1, c.1- c.2, d.1
5	Assay of LDL & HDL	**1**	**2**	b.1, c.1- c.2, d.1
6	Assay of blood total proteins & Albumin	**1**	**2**	b.1, c.1- c.2, d.1
7	Assay of LDH, GPT, GOT, Amylase, Lipase enzymes.	2	4	b.1, c.1- c.2, d.1
8	Urine analysis: - using urine-strip to test all biochemical parametres as: glucose, proteins, sp.gravity, ….etc.(normal & abnormal urine samples).	**1**	**2**	b.1, c.1- c.2, d.1
9	-Isolations of amino acid in urine sample by chromatography.	2	4	b.1, b2, c.1- c.3, d.1
10	Review	**1**	**2**	b., b.2, c.1- c.3, d.1-
11	Practical Final Exam	**1**	**2**	b.1, c.1- c.2, d.1
Number of Weeks /and Units Per Semester			**14**	**28**

VI. Teaching strategies of the course:

- Lecture
- Discussion
- Self-learning
- Seminars
- Case studies
- Practical classes
- Brain storming.

VII. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Homework Assignments	a.1-a.3, b.1-b.2, d1	4-12	5
	Total			5

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment
1	Participation and quizzes	1-12	5	5%
2	Homework Assignments	4-12	5	5%
3	Practical work and reports	ALL	10	10%
4	Mid-term theoretical Exam	9	10	10%
5	Final practical Exam	14	30	30%
6	Final theoretical Exam	16	30	30%
7	Total		100	100%

VIII. Learning Resources:

1- Required Textbook(s) (maximum two).

1- Pamela C. Champe, Richard A. Harvey, Denise R. Ferrier. 2016. Lippincott's Illustrated Reviews: Biochemistry. 7th edition. Lippincotts Williams & Willkins.
2- Robert K. Murray, Daryl K. Granner, Peter A. Mayes, Victor W. Rodwell. 2016. Harper's illustrated Biochemistry. 30th edition. McGraw-Hill.

2- Essential References.

1- David L. Nelson and Michael M, (2012), Lehninger Principles of Biochemistry, Cox. 6th edition, W.H. Freeman.
2- Devlin T. M, (2010), Textbook of Biochemistry with Clinical Correlations, 7th edition,

	New York,
3- Electronic Materials and Web Sites *etc*.	
	7. Periodical Book Website 8. http://www.kumc.edu/biochemistry/resource.htm 9. http://www.medlib.iupui.edu/ref/biochem.htm
4- Other Learning Material:	
	Hand out (if possible) prepared by the lecturer.

IX. Course Policies:

1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2	**Tardy:** - Any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** - Assignments and projects will be assessed individually unless the teacher request for group work
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the faculty rules.

Template for Course Plan (Syllabus) of Biochemistry (2)

I. Information about Faculty Member Responsible for the Course:

		Office Hours					
Name of Faculty Member							
Location& Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Identification and General Information:

1	Course Title:	Biochemistry (2)				
2	Course Code & Number:	PHA242				
3	Credit hours:	C.H				TOTAL
		Th.	Seminar	practical	Training.	
		2	-	1	-	3
4	Study level/ semester at which this course is offered:	Second year second semester				
5	Pre –requisite (if any):	Biochemistry (1)				
6	Co –requisite (if any):	None				
7	Program (s) in which the course is offered:	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	Language of teaching the course:	English, arabic				
9	Study System	Semester				
10	Mode of delivery:	Regular				
11	Location of teaching the course:	Al-Saeed University				

III. Course Description:

The course is intended to provide students with comprehensive knowledge and clear understanding of the basic concepts of metabolism. The course covers the metabolic pathways of the major biomolecules; carbohydrates, lipids, proteins, both anabolic and catabolic pathways, the regulation of metabolism and the biochemical alteration in health and disease. The course also includes practical part that helps students to perform some biochemical laboratory quantitative analysis.

IV. Course Objectives:

On completion of the course, the student will be able to:

1. Understand the major metabolic pathways that take place in human body.
2. Learn the interrelationship between carbohydrates, lipid and protein metabolism.
3. Carry out the biochemical laboratory quantitative analysis for diagnosis of different organs dysfunctions.

V. Intended learning outcomes (ILOs) of the course:

Brief summary of the knowledge or skill the course is intended to develop:
Describe carbohydrates, lipids, proteins & amino acids digestion, absorption & transportation.
Discuss blood glucose, lipids (cholesterol & lipoproteins), proteins, amino acids levels & their regulations, biological importance, and usefulness in diagnostic values.
Explain the effect of (cation & anion) as: Ca2+, Na+, K+, and HCO3-, Cl-, etc…, their roles in maintenance of gastric pH & blood pH, in health and disease state. (reaction, regulation, significance & disorders).
Differentiate between various biomolecules metabolic pathways.
Interpret and evaluate normal and abnormal biochemical data.
Perform some biochemical tests and use the results to find abnormal chemical biological values methods of correction.
Carry out laboratory tests and apply the suitable methods for analysis of different biochemical compounds.
Interact and communicate effectively and ethically with teaching staff during the learning process.

VI. Course Content:

- Distribution of Semester Weekly Plan of Course Topics/Items and Activities.

A – Theoretical Aspect:

Order	Topics List	Week Due	Contact Hours
1	**Carbohydrate digestion & metabolism:** -Glycolysis -Gluconeogenesis -Glycogenesis -Glycogenolysis -Glucouronic pathway -Pentose Phosphate Pathway -Mono saccharides interconvert able -Resulted of metabolic diseases (diabetes mellitus, …etc,)	1-4	8
2	**Dietary lipid digestion & absorption:**	5	2

	- metabolism of lipoproteins, (Chylomicron, Low Density Lipoprotein, High Density Lipoprotein, & the resulted metabolic diseases.		
3	**Fatty acids & triglycerides metabolism (synthesis & oxidation "degradation"):** -β-Oxidation of fatty acids & energy production. -Fatty acid synthesis& elongations.	6-8	6
4	Midterm exam	9	2
5	**Complex lipid metabolism:** -Phospholipids, -Glycolipids, Cerebroside and Ganglioside degradations	10	2
6	**Cholesterol metabolism:** -Cholesterol synthesis & degradation -Accumulation (atherosclerosis), -Cholesterol Ester,	11	2
7	**Protein digestion & absorption mechanisms:** Gastric juice composition. - Formation of Hcl & HCO3 -Simple diffusion -Active transport -Carrier transport	12	2
8	**Amino acids metabolism (degradation & synthesis):** - Transamination & deamination reactions. -Shuttles to transfer the reducing agents produed. - Ammonia production, its fates. -Urea cycle.	13, 14	4
9	**Conversion of amino acids to specializes products:** Special products from different amino acids & their biological importance	15	2
10	**Final exam**	16	2
Number of Weeks /and Units Per Semester		**16**	**32**

B – Practical Aspect:

Order	Topics List	Week Due	Contact Hours
1	-Define the principles of lab. safety & how to deal with the equipment's and glass ware.	1	2
2	Differentiate between serum & plasma. Assay of bilirubin (direct & indirect).	2	2
3	Assay of blood glucose. GGT-test.	3,4	4
4	Assay of blood triglyceride & cholesterol	5	2
5	Assay of LDL & HDL	6	2
6	Assay of blood total proteins & Albumin	7	2
7	Assay of LDH, GPT, GOT, Amylase, Lipase enzymes.	8, 9	4
8	Urine analysis: - using urine-strip to test all biochemical parametres as: glucose, proteins, sp.gravity, ….etc.(normal & abnormal urine samples).	10	2
9	-Isolations of amino acid in urine sample by chromatography.	11,12	4
10	Review	13	2
11	Practical Final Exam	14	2
Number of Weeks /and Units Per Semester		**14**	**28**

VII. Teaching strategies of the course:

- Lecture
- Discussion
- Self-learning
- Seminars
- Case studies
- Practical classes
- Brain storming.

VIII. Assignments:

No	Assignments	Week Due	Mark
1	Homework Assignments	4-12	5
	Total		5

IX. Schedule of Assessment Tasks for Students During the Semester:

Assessment	Type of Assessment Tasks	Week Due	Mark	Proportion of Final Assessment
1	Participation and quizzes	1-12	5	5%
2	Homework Assignments	4-12	5	5%
3	Practical work and reports	ALL	10	10%
4	Mid-term theoretical Exam	9	10	10%
5	Final practical Exam	14	30	30%
6	Final theoretical Exam	16	30	30%
7	Total	100	100%	

X. Learning Resources:

1- Required Textbook(s) (maximum two).

1- Pamela C. Champe, Richard A. Harvey, Denise R. Ferrier. 2016. Lippincott's Illustrated Reviews: Biochemistry. 7th edition. Lippincotts Williams & Willkins.
2- Robert K. Murray, Daryl K. Granner, Peter A. Mayes, Victor W. Rodwell. 2016. Harper's illustrated Biochemistry. 30th edition. McGraw-Hill.

2- Essential References.

1- David L. Nelson and Michael M, (2012), Lehninger Principles of Biochemistry, Cox. 6th edition, W.H. Freeman.
2- Devlin T. M, (2010), Textbook of Biochemistry with Clinical Correlations, 7th edition, New York,

3- Electronic Materials and Web Sites *etc*.

1- Periodical Book Website
2- http://www.kumc.edu/biochemistry/resource.htm
3- http://www.medlib.iupui.edu/ref/biochem.htm

4- Other Learning Material:	
	Hand out (if possible) prepared by the lecturer.

XI. Course Policies:

1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2	**Tardy:** - Any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** - Assignments and projects will be assessed individually unless the teacher request for group work
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the faculty rules.

Course Specification of Pharmaceutical Microbiology

I. Course Identification and General Information:

1	Course Title:	Pharmaceutical Microbiology				
2	Course Code & Number:	PHA243				
3	Credit hours:	C.H				TOTAL
		Th.	Seminar	practical	Training.	
		2		1		3
4	Study level/ semester at which this course is offered:	Second year, second semester				
5	Pre –requisite (if any):	Microbiology				
6	Co –requisite (if any):	None				
7	Program (s) in which the course is offered:	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	Language of teaching the course:	English				
9	Study System	Semester				
10	Mode of delivery:	Regular				
11	Location of teaching the course:	Faculty of medical and Health sciences, Al-Saeed University.				
12	Prepared By:	Dr. Waheed A M Alsowaidy				

II. Course Description:

The course deals with the role of microorganisms in infectious disease. The study includes the causative agent, its general characteristics, pathogenicity, clinical symptoms, laboratory diagnosis, prevention and control, and the treatment of different infections. The course also covers chemotherapy of infectious diseases, sterilization by physical and chemical methods and its application in pharmacy. Preservation and testing preservative efficiency. Evaluation of antimicrobial agents. This course also involves laboratory experiments.

III. Course Objectives:

- Highlighting major infections by organ system.
- Identification of the methods of infection and the effects of infection on different body systems.
- Introducing principles of immunization, vaccination, antimicrobial therapy infection/contamination control within a pharmacological context.
- Familiarization with microbiological tests used in quality assurance of pharmaceutical products.

IV.	Course Intended learning outcomes (CILOs) of the course	WRITE Symbol and numbe of PILOs
a.1	Differentiate bacterial, viral and fungal infections in humans and methods of prophylaxis against them.	A2
a.2	Describe classes of antimicrobial agents, their mechanism of action and indications/contraindications.	A3
b.1	Compare different antibiotics with regards to their use, efficiency and drawbacks.	B2
b.2	Classify antimicrobials according to their sensitivity and suitability for body systems, and be able to expect their indications and contraindications.	B4
c.1	Sketch the suitable method of sterilization in pharmaceutical industry and calculate the Sterility Assurance Level.	C1
c.2	Perform antibiotic sensitivity tests to select the proper antibiotic for bacterial infections.	C2
c.3	Provide counseling and advice to patients, their families, community about the use of different antimicrobial medications.	C4
d.1	Assess the requirements of research and resources of Information related to microbial world the emergence of resistance strains.	D3

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1- Differentiate bacterial, viral and fungal infections in humans and methods of prophylaxis against them.	Theoretical and practical lectures	Written and practical exams
a2- Describe classes of antimicrobial agents, their mechanism of action and indications/contraindications.	Theoretical and practical lectures	Written and practical exams

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1. Compare different antibiotics with regards to their use, efficiency and drawbacks.	Laboratory sittings theoretical lectures	Practical and written exams
b2. Classify antimicrobials according to their sensitivity and suitability for body systems, and be able to expect their indications and contraindications.	Theoretical lectures and lab sittings	Writtenand practical exams

(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1. Sketch the suitable method of sterilization in pharmaceutical industry and calculate the Sterility Assurance Level.	Lab sittings and field (factory) visits	Practical exam and field reports
c2. Perform antibiotic sensitivity tests to select the proper antibiotic for bacterial infections.	Lab working and sittings	Practical exam
c3. Provide counseling and advice to patients, their families, community about the use of different antimicrobial medications.	Lab working and sittings	Practical exam

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1- Assess the requirements of research and resources of Information related to microbial world the emergence of resistance strains. .	Field visits (hospitals and factories)	Field visits reports

V. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	contact hours
1	Respiratory infections (RTI)	a1, a2	- Upper RTI - Lower RTI	2	4
2	Hepatitis viruses	a1, a2, b1	- Viral infection of the liver - Hepatitis A and E - Hepatitis B and C	1	2
3	Retroviruses	a1, a2, b1	- Characteristics of Retroviredae family - Human disease caused by members of this viral family - HIV viruses	1	2
4	Bacteremia Septicemia and Infective endocarditis	a1, a2,b1,b2	- Bacteremia; definition, types and important causes - Septicemia and septic shock - Infective endocarditis	1	2
5	Genitourinary tract infections	a1, a2, a3, a4,b1,b2,d1	- Lower UTI - Upper UTI - Genital infection	2	4
6	**Mid-Term exam**	a1, a2, b1, b2,d1		1	2
7	Bacterial and viral GIT infections - Soft tissue infection	a1, a2, b1,b2	- Bacterial causes of GIT infection - Viral causes of GIT infection - Soft tissue infection	1	2
8	Antimicrobial agents	a1, a2, b1,b2	- Antibacterial agents - Antiviral agents - Antifungal agents	2	4
9	Disinfection and Sterilization	a1, a2, b1, b2, d1	- Antiseptics, sterilization and disinfection - Chemical sterilizers - Heat sterilizers	2	4
10	Sterile preparations, infection/contamination control – clean rooms	a1, a2 ,b1,b2	- Sterile preparations infection/contamination control - Clean rooms	1	2
11	Revision	a1, a2 b1,b2		1	2
12	**Final Exam**	a1, a2,		1	

		b1,b2,d1			2
Number of Weeks /and Units Per Semester				**16**	**32**

B - Practical Aspect: (if any)

Order	Tasks/ Experiments	Number of Weeks	contact hours	Learning Outcomes
1	Isolation and identification of pathogens from respiratory tract infections	**2**	**4**	a1,c1,c2
2	Isolation and identification of pathogens from GIT infections.	**2**	**4**	a1,a2,c1,c2,c3
3	Antimicrobial sensitivity testing.	**2**	**4**	a1,a2,c1,c2,c3
4	**Mid-Term exam**			a,1,a2,c1,c2,c3
5	Assessment of antimicrobial agents.	**1**	**2**	a1,a2,c1,c2,c3,d1
6	Assessment of the efficacy of antiseptics, disinfectants and sterilizers.	**1**	**2**	a1,c1,c2,c3
7	Microbiological testing of raw materials and pharmaceutical preparations.	**2**	**4**	a2,c1,c2,c3,d1
8	Assessment of clean rooms (filters – particle counters)	**1**	**2**	a1,a2,c1,c2,c3
9	Final exam	**1**	**2**	a,1,a2,c1,c2,c3,d1
Number of Weeks /and Units Per Semester		**12**	**24**	

VI. Teaching strategies of the course:

Theoretical and practical lectures
Videos, seminars
Practical sittings
Field visits (hospitals and factories).

VII. Assignments:

No	Assignments	Aligned CILOs (symbols)	Week Due	Mark
1	Home works	a1, a2, a3,a4,d1,	Continuous	5
2	Field visit reports	c1,c2,c3,d1	5 and 10	5

VIII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Home works	Continually	5	5%	a1, a2,d1
2	Practical laboratory work	1-11th	10	10%	b1, b2,c1,c2, c3, d1
3	Field visit reports	5 and 10	5	5%	c1,c2,c3,d1
4	Mid-term written exam	8th	10	10%	a1,a2, b1,b2
5	Final practical exam	12th	30	30%	b1, b2,c1,c2,c3,d1
6	Final written exam	16th	40	40%	a1,a2,b1,b2,d1
7	Total		100	100%	

IX. Learning Resources:

1- Required Textbook(s) (maximum two).

1- Medical Microbiology and Immunology, Levinson, W., 12th edition, 2016.
2- Medical Microbiology, Brooks, G., 24th edition, 2007.

2- Essential References.

1- Hugo WB; Russell AD. Pharmaceutical Microbiology 7th edition. 2004. Blackwell Scientific Publications, Oxford.
2- Pharmaceutical microbiology, AshutoshKar, 1st edition, 2008.

3- Electronic Materials and Web Sites *etc*.

- **Periodicals, Web sites, Etc:**
- Journal of Microbiology and Immunology
- http://www.microbiologybook.org/

X. Course Policies:

1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed

	to attend the exam and will be considered absent.
4	**Assignments & Projects**: - Assignments and projects will be assessed individually unless the teacher request for group work
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the faculty rules.
7	**Other policies**: -

Template for Course Plan (Syllabus) of Pharmaceutical Microbiology

I. - Information about Faculty Member Responsible for the Course:

		Office Hours					
Name of Faculty Member							
Location& Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Identification and General Information:

1	Course Title:	Pharmaceutical Microbiology				
2	Course Number & Code:	**PHA243**				
3	Credit hours:	C.H				Total
		Th.	Seminar	Pr.	F. Tr.	
		2		2		3
4	Study level/year at which this course is offered:	**Second year, second semester**				
5	Pre –requisite (if any):	**Microbiology**				
6	Co –requisite (if any):	**None**				
7	Program (s) in which the course is offered	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	Language of teaching the course:	**English**				
9	System of Study:	**Semester**				
10	Mode of delivery:	Regular				
11	Location of teaching the course:	**Faculty of medical and health sciences, Al-Saeed University, Taiz, Yemen**				

III. Course Description:

The course deals with the role of microorganisms in infectious disease. The study includes the causative agent, its general characteristics, pathogenicity, clinical symptoms, laboratory diagnosis, prevention and control, and the treatment of different infections. The course also covers chemotherapy of infectious diseases, sterilization by physical and chemical methods and its application in pharmacy. Preservation and testing preservative efficiency. Evaluation of antimicrobial agents. This course also involves laboratory experiments.

IV. Course Objectives:

- Highlighting major infections by organ system.
- Identification of the methods of infection and the effects of infection on different body systems.
- Introducing principles of immunization, vaccination, antimicrobial therapy infection/contamination control within a pharmacological context.
- Familiarization with microbiological tests used in quality assurance of pharmaceutical products.

V. Intended learning outcomes (ILOs) of the course:

Brief summary of the knowledge or skill the course is intended to develop**:**

- Differentiate bacterial, viral and fungal infections in humans and methods of prophylaxis against them.
- Describe classes of antimicrobial agents, their mechanism of action and indications/contraindications.
- Compare different antibiotics with regards to their use, efficiency and drawbacks.
- Classify antimicrobials according to their sensitivity and suitability for body systems, and be able to expect their indications and contraindications.
- Sketch the suitable method of sterilization in pharmaceutical industry and calculate the Sterility Assurance Level.
- Perform antibiotic sensitivity tests to select the proper antibiotic for bacterial infections.
- Provide counseling and advice to patients, their families, community about the use of different antimicrobial medications.
- Assess the requirements of research and resources of Information related to microbial world the emergence of resistance strains.

VI. Course Content:

- Distribution of Semester Weekly Plan of Course Topics/Items and Activities.

A – Theoretical Aspect:

Order	Topics List	Week Due	Contact Hours
1	**Respiratory infections (RTI):** - Upper RTI - Lower RTI	1st, 2nd	4
2	**Hepatitis viruses:** - Viral infection of the liver - Hepatitis A and E - Hepatitis B and C	3rd	2

3	**Retroviruses:** - Characteristics of Retroviredae family - Human disease caused by members of this viral family - HIV viruses	4th	2
4	**Bacteremia, Septicemia and Infective endocarditis:** - Bacteremia; definition, types and important causes - Septicemia and septic shock - Infective endocarditis	5th	2
5	**Genitourinary tract infections:** - Lower UTI - Upper UTI - Genital infection	6th, 7th,	4
6	**Mid-Term exam**	8th	2
7	**Bacterial and viral GIT infections - Soft tissue infection:** - Bacterial causes of GIT infection - Viral causes of GIT infection - Soft tissue infection	9th	2
8	**Antimicrobial agents:** - Antibacterial agents - Antiviral agents - Antifungal agents	10th, 11th,	4
9	**Disinfection and Sterilization:** - Antiseptics, sterilization and disinfection - Chemical sterilizers - Heat sterilizers	12th, 13th	4
10	**Sterile preparations, infection/contamination control – clean rooms**	14th	2
11	- **Revision**	15th	2
	Final Exam	16th	**2**
Number of Weeks /and Units Per Semester		**16**	**32**

B – Practical Aspect:

Order	Topics List	Week Due	Contact Hours
1	Isolation and identification of pathogens from respiratory tract infections	**1st, 2nd**	**4**
2	Isolation and identification of pathogens from GIT infections.	**3rd, 4th**	**4**

3	Antimicrobial sensitivity testing.	**5th, 6th**	**4**
4	**Mid-Term exam**	**7th**	**2**
5	Assessment of antimicrobial agents.	**8th**	**2**
6	Assessment of the efficacy of antiseptics, disinfectants and sterilizers.	**9th**	**2**
7	Microbiological testing of raw materials and pharmaceutical preparations.	**10th, 11th**	**4**
8	Assessment of clean rooms (filters – particle counters)	**12th, 13th**	**2**
9	Final exam	**14th**	**2**
Number of Weeks /and Units Per Semester		14	28

VII. Teaching strategies of the course:

Theoretical and practical lectures
Videos, seminars
Practical sittings
Field visits (hospitals and factories).

VIII. Revision

No	Assignments	Week Due	Mark
1	Home works	Continually	5
2	Field visit reports	5 and 10	5

IX. Schedule of Assessment Tasks for Students during the Semester:

Assessment	Type of Assessment Tasks	Week Due	Mark	Proportion of Final Assessment
1	Home works	Continually	5	5%
2	Practical laboratory work	1-11th	10	10%
3	Field visit reports	5 and 10	5	5%
4	Mid-term written exam	8th	10	10%
5	Final practical exam	12th	30	30%

6	Final written exam	16th	40	40%
7	Total		100	100%

X. Learning Resources:

1- Required Textbook(s) (maximum two).

1- Medical Microbiology and Immunology, Levinson, W., 12th edition, 2016.
2- Medical Microbiology, Brooks, G., 24th edition, 2007.

2- Essential References.

1- Hugo WB; Russell AD. Pharmaceutical Microbiology 7th edition. 2004. Blackwell Scientific Publications, Oxford.
2- Pharmaceutical microbiology, AshutoshKar, 1st edition, 2008.

3- Electronic Materials and Web Sites *etc*.

- **Periodicals, Web sites, Etc:**
- Journal of Microbiology and Immunology. http://www.microbiologybook.org/

XI. Course Policies:

1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam.
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** - Assignments and projects will be assessed individually unless the teacher request for group work.
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course.
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:**

Course Specification of Pharmaceutics (2)

I. Course Identification and General Information:

1	Course Title:	Pharmaceutics (2)				
2	Course Code & Number:	PHA253				
3	Credit hours:	C.H				TOTAL
		Th.	Seminar	practical	Training.	
		2		1		3
4	Study level/ semester at which this course is offered:	2nd year / 2nd semester				
5	Pre –requisite (if any):	Pharmaceutics (1)				
6	Co –requisite (if any):	none				
7	Program (s) in which the course is offered:	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	Language of teaching the course:	English				
9	Study System	Semester				
10	Mode of delivery:	Regular				
11	Location of teaching the course:	Al-Saeed University campus				
12	Prepared By:	Dr. Abdulkarim Kassem Alzomor				

II. Course Description:

This course is the second part of "Pharmaceutics" courses that are intended to provide knowledge and skills in designing pharmaceutical dosage forms. It deals with designing of compressed gases (pharmaceutical aerosols), semisolid dosage forms and suppositories. The students also will be able to apply knowledge in performing laboratory experiments.

III. Course Objectives:

This course aims to:

1- Introduce students to skin drug delivery
2- Introduce students to semi solid dosage forms such as ointment, paste, gel, cream. and suppositories.
3- Study the advantage, disadvantage, excipients need to design compressed gases (pharmaceutical aerosols).

IV.	Course Intended learning outcomes (CILOs) of the course	WRITE Symbol and number o PILOs
a.1	Explain the general properties, the types and roles of	A2

	excipients, advantages and disadvantages of pharmaceutical aerosols, semisolid and suppositories dosage forms.	
a.2	Describe the stages of designing pharmaceutical aerosols, semisolid preparations and suppositories.	**A2**
b.1	Classify pharmaceutical aerosols, semisolid preparations and suppositories dosage forms.	**B2, B3**
b.2	Design pharmaceutical aerosols, semisolid preparations and suppositories dosage forms.	**B2, B3, B4**
c.1	Handle efficiently and safely the chemical materials and tools used in the laboratory.	**C1, C5**
c.2	Operate the instruments and prepare safe and effective extemporaneous semisolid preparations and suppositories.	**C1, C4, C5**
d.1	Communicate effectively and behave in discipline with colleagues.	**D1**
d.2	Participate efficiently with colleagues in a team work	**D1**

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1 Explain the general properties, the types and roles of excipients, advantages and disadvantages of pharmaceutical aerosols, semisolid and suppositories dosage forms.	- Lectures and Groups discussion. - Presentations - Self - learning.	Quizzes, Written exam.
a2 Describe the stages of designing pharmaceutical aerosols, semisolid preparations and suppositories.		

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1. Classify pharmaceutical aerosols, semisolid preparations and suppositories.	- Discussions and Training - Field visits - Problem solving - Practical classes	- Quizzes, Homework - Observation - Task's Evaluates
b2. Design pharmaceutical aerosols, semisolid preparations and suppositories.		

(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to

Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1. Handle efficiently and safely the chemical materials and tools used in the laboratory. c2. Operate the instruments and prepare safe and effective extemporaneous semisolid preparations and suppositories.	- Discussions and Training - Field visits - Problem solving - Practical classes	- Quizzes, Homework - Observation - Task's Evaluates

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1. Communicate effectively and behave in discipline with colleagues. d2. Participate efficiently with colleagues in a team work.	- Group discussions - Cooperative learning. - Self – learning - Inductive and deductive	- Homework - Evaluates oral presentation

I. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	contact hours
1	**Pharmaceutical aerosols**	a1, a2, b1, b2, d1	Definition, advantages, disadvantages, types of aerosols, anatomical features of the bronchi, Pressurized packages (Type of propellants, Containers , Formulation aspects, Air-blast nebulizers), methods of preparation (pressurized filling, cold filling), quality control evaluation	3	6

2	**Semisolid dosage forms: (1) Introduction**	a1, a2, b1, b2, d2	• **introduction:** definitions , advantages, disadvantages, types, anatomical features and targets of the skin, Factors effect on drug absorption from the skin • Classification of semisolid preparation	1	2
3	**Semisolid dosage forms : (2)Ointments and pastes**	a1, a2, b1, b2, d1	• **ointments** (definitions, advantages, advantages, disadvantages, classification based on type of ointment base, formulation considerations, method of preparation**)** • **Pastes:** (definitions, advantages, advantages, disadvantages, classification based on type of ointment base,	3	6
4	**Mid-term Exam**			1	2
5	**Semisolid dosage forms (3) Creams and gels**	a1, a2, b1, b2, c1, d1	• **Creams** (definitions, advantages, advantages, disadvantages, classification, formulation considerations, method of preparation • **Gels** (definitions, advantages, classification, formulation **,** considerations, method of preparation	3	6
6	**Suppositories**	a1, a2, b1, b2, d2	definitions, advantages, advantages, disadvantages, classification (rectal, vaginal) formulation, types of suppository bases, method of preparation	2	4
7	**Quality control tests**	a1, a2, b1, b2,c1,c2, d1, d2	Quality control tests for semisolid and suppositories (Physical, chemical and microbial test)	1	2
8	Review for semisolid			1	2
9	**FINAL - EXAM**			1	2
Number of Weeks /and Units Per Semester				**16**	**32**

B - Practical Aspect:

Order	Tasks/ Experiments	Number of Weeks	contact hours	Aligned Couse Intended Learning Outcomes CILOs
1.	Pharmaceutical aerosols: construction and use	1	2	c1,c2, , d1, d2
2.	Preparation of salicylic acid 2 % ointment in simple ointment base	1	2	c1,c2, , d1, d2
1.	Preparation of hydrophilic ointment USP	1	2	c1,c2, , d1, d2
2.	Preparation of Polyethylene glycol ointment base.	1	2	c1,c2, , d1, d2
3.	Preparation of o / w creams: vanishing cream base	2	4	c1,c2, , d1, d2
4.	Preparation of w/o creams: cold cream base	1	2	c1,c2, , d1, d2
5.	Preparation of hydrophilic gel base : Carbomer or Carboxymethyl cellulose gel	2	4	c1,c2, , d1, d2
6.	Preparation of Aspirin in cocoa butter base suppositories.	1	2	c1,c2, , d1, d2
7.	Preparation of Glycerin suppositories.	1	2	c1,c2, , d1, d2
8.	Preparation of thiobroma oil suppositories.	1	2	c1,c2, , d1, d2
9.	Preparation of Emo-gel	1	2	c1, c2, , d1, d2
12	**PRACTICAL EXAM**	1	2	c1, c2, , d1, d2
Number of Weeks /and Units Per Semester		**14**	**28**	

II. Teaching strategies of the course:

- Lectures
- Groups discussion.
- Discussions and Training
- Practical presentations
- Field visits
- Problem solving
- Practical in Lab
- Cooperative learning.
- Simulation Group discussions
- Self – learning

III. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Class attendance and participation	**a1, a2, b1, b2, c1,c2 d1, d2**	weekly	5
2	Homework, presentation	**a1, a2, b1, b2, c1,c2 d1.**	11	5

IV. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method		Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Assignments		1-14	10	10%	a1, b1, b2, c1, a2, d1,d2
3	Mid-semester exam of theoretical part (written exam		**7**	10	10%	a1, a2, b1, c1, d1,d2
5	Lab. Term works	Attitude and Report	1-12	10	10%	c1, c2,d1,d2
6		Accomplishments				
7	Final exam (practical)		13	30	30%	c1, c2,d1,d2
8	Final exam of theoretical part (written exam)		16	40	40%	a1, a2, b1, b2, c1, d1,d2
Total				100	100%	

V. Learning Resources

1- Required Textbook(s) (maximum two).

VI. Aulton M.E., Pharmaceutics: the science of dosage form design, 4th edition, 2010, Churchill Livingstone, UK

VII. Ansel`s Pharmaceutical dosage forms and drug delivery system, 2011, Lippincott Williams and Wilkins, USA.

2- Essential References.

3. Williams and Wilkins (2005). Remington; the Science and Practice of Pharmacy (2first edition). Publisher: Lippincott.
4. Herbert A. Lieberman, Martin M. Reiger, GeilbertS.Banker Pharmaceutical Dosage Forms, Vol. 3 (Pharmaceutical Dosage Forms-Disperse), Third Edition, 2010.

3- Electronic Materials and Web Sites *etc*.

www.pubmed.com

X.Course Policies:

1	**Class Attendance:**

	- At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects**: - Assignments and projects will be assessed individually unless the teacher request for group work
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the faculty rules.
7	**Other policies**:

Template for Course Plan (Syllabus) of Pharmaceutics (2)

I. - Information about Faculty Member Responsible for the Course:

Office Hours							Name of Faculty Member
THU	WED	TUE	MON	SUN	SAT		Location& Telephone No.
							E-mail

II. Course Identification and General Information:

1	Course Title:	Pharmaceutics (2)				
2	Course Code & Number:	PHA253				
3	Credit hours:	C.H				TOTAL
		Th.	Seminar	practical	Training.	
		2		1		3
4	Study level/ semester at which this course is offered:	2nd year / 2nd semester				
5	Pre –requisite (if any):	Pharmaceutics (1)				
6	Co –requisite (if any):	none				
7	Program (s) in which the course is offered:	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	Language of teaching the course:	English				
9	Study System	Semester				
10	Mode of delivery:	Regular				
11	Location of teaching the course:	Al-Saeed University campus				

III. Course Description:

This course is the second part of "Pharmaceutics" courses that are intended to provide knowledge and skills in designing pharmaceutical dosage forms. It deals with designing of compressed gases (pharmaceutical aerosols), semisolid dosage forms and suppositories. The students also will be able to apply knowledge in performing laboratory experiments.

IV. Course Objectives:

This course aims to:

1. Introduce students to skin drug delivery
2. Introduce students to semi solid dosage forms such as ointment, paste, gel, cream. and suppositories.

3. Study the advantage, disadvantage, excipients need to design compressed gases (pharmaceutical aerosols).

V. Intended learning outcomes (ILOs) of the course:

1. Explain the general properties, the types and roles of excipients, advantages and disadvantages of pharmaceutical aerosols, semisolid and suppositories dosage forms.
2. Describe the stages of designing pharmaceutical aerosols, semisolid preparations and suppositories
3. Classify pharmaceutical aerosols, semisolid preparations and suppositories dosage forms.
4. Design pharmaceutical aerosols, semisolid preparations and suppositories dosage forms.
5. Handle efficiently and safely the chemical materials and tools used in the laboratory.
6. Operate the instruments and prepare safe and effective extemporaneous semisolid preparations and suppositories.
7. Communicate effectively and behave in discipline with colleagues.
8. Participate efficiently with colleagues in a team work.

VI. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Sub Topics List	Week Due	contact hours
1	**Pharmaceutical aerosols**	Definition, advantages, disadvantages, types of aerosols, anatomical features of the bronchi, Pressurized packages (Type of propellants,	W1	4
		Containers , Formulation aspects, Air-blast nebulizers), methods of preparation (pressurized filling, cold filling), quality control evaluation	W2	
2	**Semisolid dosage forms: (1) Introduction**	• **introduction:** definitions, advantages, disadvantages, types, anatomical features and targets of the skin,	W3	4
		• Factors effect on drug absorption from the skin • Classification of semisolid preparation • **Drug Delivery System (DDS)**	W4	

3	**Semisolid dosage forms : (2)Ointments and pastes**	• **ointments** (definitions, advantages, advantages, disadvantages, classification based on type of ointment base, formulation considerations, method of preparation**)**	W5	4
		• **Pastes:** (definitions, advantages, advantages, disadvantages, classification based on type of ointment base,	W6	
4	**Mid-term Exam**		W7	2
5	**Semisolid dosage forms (3) Creams and gels**	• Creams (definitions, advantages, advantages, disadvantages, classification, formulation considerations, method of preparation	W8	6
		• Gels (definitions, advantages, classification, formulation , considerations, method of preparation	W9	
		• **Formulation of semisolids and Packaging**	W10	
6	**Suppositories**	• definitions, advantages, advantages, disadvantages, classification (rectal, vaginal)	W11	6
		• formulation, types of suppository bases, method of preparation	W12 &W13	
7	**Quality control tests**	• Quality control tests for semisolid and suppositories (Physical, chemical and microbial test)	W14	2
8	• Review for semisolid		W15	2
9	FINAL - EXAM		W16	2
Number of Weeks /and Units Per Semester			**16**	**32**

B - Practical Aspect:

Order	Tasks/ Experiments	Number of Weeks	contact hours
1.	Pharmaceutical aerosols: construction and use	**W1**	**2**
2.	Preparation of salicylic acid 2 % ointment in simple ointment base	**W2**	**2**
3.	Preparation of hydrophilic ointment USP	**W3**	**2**
4.	Preparation of Polyethylene glycol ointment base.	**W4**	**2**
5.	Preparation of o / w creams: vanishing cream base	**W5, W6**	**4**
6.	Preparation of w/o creams: cold cream base	**W7**	**2**
7.	Preparation of hydrophilic gel base: Carbomer or Carboxymethyl cellulose gel	**W8, W9**	**4**

8.	Preparation of Aspirin in cocoa butter base suppositories.	**W10**	**2**
9.	Preparation of Glycerin suppositories.	**W11**	**2**
10.	Preparation of thiobroma oil suppositories.	**W12**	**2**
11.	Preparation of Emo-gel	**W13**	**2**
12	PRACTICAL EXAM	**W14**	**2**
Number of Weeks /and Units Per Semester		**14**	**28**

VII. Teaching strategies of the course:

- Lectures
- Groups discussion.
- Discussions and Training
- Practical presentations
- Field visits
- Problem solving
- Practical in Lab
- Cooperative learning.
- Simulation Group discussions
- Self – learning

VIII. Assignments:

No	Assignments	Week Due	Mark
1	Class attendance and participation	weekly	5
2	Homework, presentation	11	5

IX. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method		Week Due	Mark	Proportion of Final Assessment
1	Assignments		1-14	10	**10%**
3	Mid-semester exam of theoretical part (written exam		**7**	**10**	**10%**
5	Lab. Term works	Attitude and Report	1-12	10	**10%**
6		Accomplishments			
7	Final exam (practical)		13	30	30%
8	Final exam of theoretical part (written exam)		16	40	40%
Total				100	100%

X. Learning Resources

1- Required Textbook(s) (maximum two).

1. Aulton M.E., Pharmaceutics: the science of dosage form design, 4th edition, 2010, Churchill Livingstone, UK
2. Ansel`s Pharmaceutical dosage forms and drug delivery system, 2011, Lippincott Williams and Wilkins, USA.

2- Essential References.

1. Williams and Wilkins (2005). Remington; the Science and Practice of Pharmacy (2first edition). Publisher: Lippincott.
2. Herbert A. Lieberman, Martin M. Reiger, GeilbertS.Banker Pharmaceutical Dosage Forms, Vol. 3 (Pharmaceutical Dosage Forms-Disperse), Third Edition, 2010.

3- Electronic Materials and Web Sites *etc*.

www.pubmed.com

XI.Course Policies:

1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam.
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** - Assignments and projects will be assessed individually unless the teacher request for group work.
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course.
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:**

Course Specification of pharmacognosy (2)

I. Course Identification and General Information:

1	Course Title:	Pharmacognosy (2)				
2	Course Code & Number:	PHA273				
3	Credit hours:	C.H				TOTAL
		Th.	Seminar	practical	Training.	
		2		1		3
4	Study level/ semester at which this course is offered:	*2nd year / 2nd semester*				
5	Pre –requisite (if any):	Pharmacognosy (1)				
6	Co –requisite (if any):					
7	Program (s) in which the course is offered:	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	Language of teaching the course:	English				
9	Study System	Semester				
10	Mode of delivery:	Regular				
11	Location of teaching the course:	University campus				
12	Prepared By:	Dr. Abdulrahman Roshan				

II. Course Description:

The course is a continuation of the previous one. It is concerned with the study of drugs from plant sources, their cultivation, collection, drying, storage, adulteration and plant cell contents. It focuses on medicinal drugs from seeds, fruits, herbs, subterranean organs and unorganized drugs with their active constituents, medicinal uses as well as macro and micro-morphological characters. It also considers the method of extraction and isolation of phytochemicals. The course also includes practical part that will help students to apply their learned knowledge.

III. Course Objectives:

At the end of the course, the students should be able to:

1- Demonstrate knowledge of crude drugs, official drugs, nomenclature and classification.

2- Student will be able to learn the proper processes for preparing medicinal plants for commercial market (cultivation, collection, drying, packing, storage and preservation) and extraction method.

3- Describe the diagnostic characters (morphologically and microscopically) of the drugs from different organs of medicinal plants such as seeds, fruits, herbs, subterranean organs and unorganized drugs.

4- Give an account on the active constituents of the studied drugs as well as their medicinal uses and method of isolation.

IV.	Course Intended learning outcomes (CILOs) of the course	WRITE Symbol and number of PILOs
a.1	Recognize the principles of pharmacognosy; cultivation, collection, drying, storage of natural products and the factors affecting these processes.	**A2**
a.2	Outline the morphological and histological characters (of seeds, fruits, herbs, subterranean organs and unorganized drugs) and the extraction and isolation methods.	**A2**
a.3	State the biological activity, active constituents, uses, chemical tests, common adulterants in the provided drugs in the course.	**A2, A3**
b.1	Determine unknown drugs; seeds, fruits, herbs, subterranean organs and unorganized drugs morphologically, microscopically and chemically.	**B2**
b.2	Determine microscopical and chemical methods for qualitative evaluation of natural drugs and method of extraction and isolation.	**B2, B4**
c.1	Identify the authentication of any of the studied drugs (entire drug or in powdered form) and relate them to different plant organs.	**C1**
c.2	Perform experiments for identification of plant (powders) drugs and extraction, isolation and detection of adulteration according to good laboratory practice and professional standards.	**C1, C5**
d.1	Demonstrate independent and team working, research and communication skills.	**D1, D3**

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1- Recognize the principles of pharmacognosy; cultivation, collection, drying, storage of natural products and the factors affecting these processes.	Lecture and group discussion	Participation, quizzes and written exam
Outline the morphological and histological characters (of seeds, fruits, herbs, subterranean organs and unorganized		

drugs) and the extraction and isolation methods.		
a3- State the biological activity, active constituents, uses, chemical tests, common adulterants in the provided drugs in the course.		

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1- Determine unknown drugs; seeds, fruits, herbs, subterranean organs and unorganized drugs morphologically, microscopically and chemically.	Lecture, discussion and problem based learning, practical (lab) classes	Oral presentation, written and practical examination
b2- Determine microscopical and chemical methods for qualitative evaluation of natural drugs and method of extraction and isolation.		

(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1- Identify the authentication of any of drugs (entire drug or in the studied powdered form) and relate them to different plant organs.	Laboratory work	Practical works, Practical reports and presentations based on their experimental work
c2- Perform experiments for identification of plant (powders) drugs and extraction, isolation and detection of adulteration according to good laboratory practice and professional standards.		

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1- Demonstrate independent and team working, research and communication skills.	Practical class, assignment and discussion in groups	Reports, presentations and communication with the lecturer and colleagues.

V. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	contact hours
1	Medicinal seeds	a1-a3, b1, b2, c1, d1	Seed definition, types, morphology and anatomy. -Nux vomica, Linseed and Strophanthus. -Fenugreek, Black mustard and Cardamom. -Nutmeg, Colchicum and Psyllium. -Medicinal unofficial seeds (e.g. Areca, Coffee beans, Calabar bean, Castor and Cocoa seeds).	3	6
2	Medicinal fruits	a1-a3, b1, b2, c1, d1	Fruits definition, types, morphology and anatomy. Umbelliferous fruits: Fennel, Anise, Caraway, Coriander. Ammi visnaga, and Ammi majus. Capsicum fruit and Colocynth fruit.	2	4
3	Mid-Term Exam	a1-a3, b1, b2, c1		1	2
4	Medicinal fruits	a1-a3, b1, b2, c1, d1	Senna fruit, Bitter orange peel, Lemon. Medicinal unofficial fruits (e.g. Cumin, Dill, Hemlock, Black pepper and Cubebs).	2	4
5	Medicinal herbs	a1-a3, b1, b2, c1, d1	Herbs definition Lobelia, Menth, Thyme, Lavender, Hyoscyamus, Cannabis, Ephedra	1	2
6	Medicinal subterranean organs	a1-a3, b1, b2, c1, d1	Subterranean organs anatomy and morphology; Liquorice, Ginger, Valerian, Ipecac, Sarsaparilla. Rauwlfia, Ginseng, Senega,	2	4

			Primula, Devils claw.		
7	Unorganized drugs	a1-a3, b1, b2, c1, d1	Unorganized drugs definition, types, morphology; Gums, Resins, Extract, Latex, Dried juice, Gelatin	1	2
8	Extraction of plant material	a2, b2, c2, d1	Definition; character of the solvents; methods of extraction.	1	2
9	Separation and Isolation of plant constituents	a2, b2, c2, d1	Distillation; fractional liberation; fractional crystallization; chromatography	1	2
10	General Revision	a1-a3, b1- b2, c1, c2, d1		1	2
11	**Final exam**	a1-a3, b2, c1		1	2
Number of Weeks /and Units Per Semester				**16**	**32**

B - Practical Aspect:

Order	Tasks/ Experiments	Number of Weeks	contact hours	Learning Outcomes
1	Macro- and Microscopical examination of powdered Fenugreek seeds, Cardamom and Linseed seeds.	**1**	**2**	**a2, a3, b1-b2, c1-c2, d1**
2	Macro- and Microscopical examination of Fennel, Anise, Cumin and Caraway fruits fruits.	**1**	**2**	**a2, a3, b1-b2, c1-c2, d1**
3	Macro- and Microscopical examination of Coriander and Ammi visnaga fruits.	**1**	**2**	**a2, a3, b1-b2, c1-c2, d1**
4	Macro- and Microscopical examination of Capsicum Colocynth and Black pepper fruits.	**1**	**2**	**a2, a3, b1-b2, c1-c2, d1**
5	Macro- and Microscopical examination of Liqourice rhizomes, Ginger.	**1**	**2**	**a2, a3, b1-b2, c1-c2, d1**
6	Examination of powdered Rhubarb, powdered Curcuma, Jalap.	**1**	**2**	**a2, a3, b1-b2, c1-c2, d1**
7	Unorganized drugs (Gum Arabic, Gum tragacanth, Gelatin, Agar)	**1**	**2**	**a2, a3, b1-b2, c1-c2, d1**
8	Unorganized drugs (Aloe, Colophony,	**1**	**2**	**a2, a3, b1-b2, c1-c2,**

	Myrrh, Asafotide)			**d1**
9	Extraction methods	**1**	**2**	**a2, a3, b1-b2, c1-c2, d1**
10	General method for alkaloids extraction (or other phytochemical class)	**1**	**2**	**a2, a3, b1-b2, c1-c2, d1**
11	Thin Layer Chromatography (TLC)	**1**	**2**	**a2, a3, b1-b2, c1-c2, d1**
12	Presentation of the assignment (collection and drying different plant parts).	**1**	**2**	**a2, a3, b1-b2, c1-c2, d1**
13	Revision	**1**	**2**	**a2, a3, b1-b2, c1-c2, d1**
14	**Practical Exam**	**1**	**2**	**a3,b1-b2, c1, c2**
Number of Weeks /and Units Per Semester		**14**	**28**	

VI. Teaching strategies of the course:

- Lecture
- Group discussion
- Problem based learning
- Practical (lab) classes
- Assignment

VII. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Collection and drying different plant parts+ Information about the plant	**a1, a3, b1, b2**	12	5%
2	Lab reports	**a1, a3, b1, b2, c1, d1**	1-6, 8-12	10%
3				

VIII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Attendance / quiz	All	5	5%	
2	Lab reports	1-6, 8-12	10	10%	**a1, a3, b1, b2, c1, d1**
3	Med- Term Exam	7	10	10%	**a1-a3, b1, b2, c1**
4	Research assignment	12	5	5%	**a1, a3, b1, b2**

5	Practical exam	14	30	30%	**a3,b1-b2, c1, c2**
6	Final written exam	16	40	40%	**a1-a3, b2, c1**
7			100	100%	

IX. Learning Resources:

1- Required Textbook(s) (maximum two).

1- Evans, William Charles, Evans, Daphne, & Trease, George Edward. (2009). Trease and Evans pharmacognosy (16th ed. / rev. with the assistance of Daphne Evans.). Saunders/Elsevier.
2- Shah Biren N., Seth A.K. (2010). Textbook of Pharmacognosy and Phytochemistry, First Edition, Elsevier,

2- Essential References.

1- Heinrich M., Barnes J., Garcia J., Gibbons S., Williamson E. (2018) Fundamentals of Pharmacog and Phytotherapy 3rd Edition, Saunders/Elsevier
2-Graff A. (2011) American Herbal Pharmacopoeia: Botanical Pharmacognosy-Microscopic Characterization of Botanical Medicines. Taylor and Francis

3- Electronic Materials and Web Sites *etc.*

1- http://www.botanical.com
2- American Botanical Council (ABC) https://www.herbalgram.org

X. Course Policies:

1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects**: - Assignments and projects will be assessed individually unless the teacher request for group work

5	**Cheating:** - Cheating by any means will cause the student failure and he/she must re-study the course
6	**Plagiarism:** Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:**

Template for Course Plan (Syllabus) of Pharmacognosy (2)

I. - Information about Faculty Member Responsible for the Course:

		Office Hours					
Name of Faculty Member							
Location& Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Identification and General Information:

1	Course Title:	Pharmacognosy (2)				
2	Course Number & Code:	PHA273				
3	Credit hours:	C.H				Total
		Th.	Seminar	Pr.	F. Tr.	
		2		1		3
4	Study level/year at which this course is offered:	*2nd year / 2nd semester*				
5	Pre –requisite (if any):	Pharmacognosy (1)				
6	Co –requisite (if any):	None				
7	Program (s) in which the course is offered	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	Language of teaching the course:	English				
9	System of Study:	Semester				
10	Mode of delivery:	Regular				
11	Location of teaching the course:	University campus				

III. Course Description:

The course is a continuation of the previous one. It is concerned with the study of drugs from plant sources, their cultivation, collection, drying, storage, adulteration and plant cell contents. It focuses on medicinal drugs from seeds, fruits, herbs, subterranean organs and unorganized drugs with their active constituents, medicinal uses as well as macro and micro-morphological characters. It also considers the method of extraction and isolation of phytochemicals. The course also includes practical part that will help students to apply their learned knowledge.

IV. Course Objectives:

At the end of the course, the students should be able to

1- Demonstrate knowledge of crude drugs, official drugs, nomenclature and classification.

2- Learn the proper processes for preparing medicinal plants for commercial market (cultivation, collection, drying, packing, storage and preservation) and extraction method.

3- Describe the diagnostic characters) morphologically and microscopically (of the drugs from different organs of medicinal plants such as seeds, fruits, herbs, subterranean organs and unorganized drugs.

4- Give an account on the active constituents of the studied drugs as well as their medicinal uses and method of isolation.

V. Intended learning outcomes (ILOs) of the course:

- Brief summary of the knowledge or skill the course is intended to develop**:**

1- Recognize the principles of pharmacognosy; cultivation, collection, drying, storage of natural products and the factors affecting these processes.
2- Outline the morphological and histological characters (of seeds, fruits, herbs, subterranean organs and unorganized drugs) and the extraction and isolation methods.
3- State the biological activity, active constituents, uses, chemical tests, common adulterants in the provided drugs in the course.
4- Determine unknown drugs; seeds, fruits, herbs, subterranean organs and unorganized drugs morphologically, microscopically and chemically.
5- Determine microscopical and chemical methods for qualitative evaluation of natural drugs and method of extraction and isolation.
6- Identify the authentication of any of the studied drugs (entire drug or in powdered form) and relate them to different plant organs.
7- Perform experiments for identification of plant (powders) drugs and extraction, isolation and detection of adulteration according to good laboratory practice and professional standards.
8- Demonstrate independent and team working, research and communication skills.

VI. Course Content:

- Distribution of Semester Weekly Plan of Course Topics/Items and Activities.

A – Theoretical Aspect:

Order	Topics List	Week Due	Contact Hours
1	Medicinal seeds: definition, types, morphology and anatomy. Nux vomica, Linseed, Fenugreek and Strophanthus.	1st	2

2	Medicinal seeds: Black mustard and Cardamom, Nutmeg, Colchicum, Psyllium.	2nd	2
3	Medicinal unofficial seeds: (e.g. Areca, Coffee beans, Calabar bean, Castor and Cocoa seeds).	3rd	2
4	Medicinal fruits: definition, types, morphology and anatomy. Umbelliferous fruits: Fennel, Anise, Caraway, Coriander.	4th	2
5	Medicinal fruits: Ammi visnaga, and Ammi majus. Capsicum fruit and Colocynth fruit.	5th	2
6	Medicinal fruits: Senna fruit, Bitter orange peel, Lemon.	6th	2
7	**Mid-Term Exam**	7th	2
8	Medicinal unofficial fruits (e.g. Cumin, Dill, Hemlock, Black pepper and Cubebs).	8th	2
9	Medicinal herbs: definition; Lobelia, Menth, Thyme, Lavender, Hyoscyamus, Cannabis, Ephedra	9th	2
10	Medicinal subterranean organs: anatomy and morphology; Liquorice, Ginger, Valerian, Ipecac, Sarsaparilla.	10th	2
11	Medicinal subterranean organs: Rauwlfia, Ginseng, Senega, Primula, Devils claw.	11th	2
12	Unorganized drugs: definition, types, morphology; Gums, Resins, Extract, Latex, Dried juice, Gelatin	12th	2
13	Extraction of plant material: definition; character of the solvents; methods of extraction.	13th	2
14	Separation and Isolation of plant constituents: Distillation; fractional liberation; fractional crystallization; chromatography	14th	2
15	General Revision	15th	2
16	**Final exam**	16th	2
Number of Weeks /and Units Per Semester		**16**	**32**

B – Practical Aspect:

Order	Topics List	Week Due	Contact Hours
1	Macro- and Microscopical examination of powdered Fenugreek seeds, Cardamom and Linseed seeds.	1st	2
2	Macro- and Microscopical examination of Fennel, Anise, Cumin and Caraway fruits fruits.	2nd	2

3	Macro- and Microscopical examination of Coriander and Ammi visnaga fruits.	3rd	2
4	Macro- and Microscopical examination of Capsicum Colocynth and Black pepper fruits.	4th	2
5	Macro- and Microscopical examination of Liqourice rhizomes, Ginger.	5th	2
6	Examination of powdered Rhubarb, powdered Curcuma, Jalap.	6th	2
7	Unorganized drugs (Gum Arabic, Gum tragacanth, Gelatin, Agar)	7th	2
8	Unorganized drugs (Aloe, Colophony, Myrrh, Asafotide)	8th	2
9	Extraction methods	9th	2
10	General method for alkaloids extraction (or other phytochemical class)	10th	2
11	Thin Layer Chromatography (TLC)	11th	2
12	Presentation of the assignment (collection and drying different plant parts).	12th	2
13	Revision	13th	2
14	**Practical Exam**	14th	2
Number of Weeks /and Units Per Semester		**14**	**28**

VII. Teaching strategies of the course:

- Lecture
- Group discussion
- Problem based learning
- Practical (lab) classes
- Assignment

VIII. Assignments:

No	Assignments	Week Due	Mark
1	Collection and drying different plant parts+ Information about the plant	12	5%
2	Experimental lab reports	1-6, 8-12	10%

IX. Schedule of Assessment Tasks for Students During the Semester:

Assessment	Type of Assessment Tasks	Week Due	Mark	Proportion of Final Assessment
1	Attendance / quiz	All	5	5%
2	Lab reports	1-6, 8-12	10	10%
3	Med- Term Exam	7	10	10%
4	Research assignment	12	5	5%
5	Practical exam	14	30	30%
6	Final written exam	16	40	40%
7	**Total**		**100**	**100%**

X. Learning Resources:

1- Required Textbook(s) (maximum two).

1- Evans, William Charles, Evans, Daphne, & Trease, George Edward. (2009). Trease and Evans pharmacognosy (16th ed. / rev. with the assistance of Daphne Evans.). Saunders/Elsevier.
2- Shah Biren N., Seth A.K. (2010). Textbook of Pharmacognosy and Phytochemistry, First Edition, Elsevier,

2- Essential References.

1- Heinrich M., Barnes J., Garcia J., Gibbons S., Williamson E. (2018) Fundamentals of Pharmacognosy and Phytotherapy 3rd Edition, Saunders/Elsevier
2-Graff A. (2011) American Herbal Pharmacopoeia: Botanical Pharmacognosy-Microscopic Characterization of Botanical Medicines. Taylor and Francis

3- Electronic Materials and Web Sites *etc*.

1- http://www.botanical.com
2- American Botanical Council (ABC) https://www.herbalgram.org

XI. Course Policies:

1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam.
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.

3	**Exam Attendance/Punctuality:** **-** any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** - Assignments and projects will be assessed individually unless the teacher request for group work.
5	**Cheating**: **-** Cheating by any means will cause the student failure and he/she must re-study the course.
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:**

Third level, First semester

Course Specification of Pathophysiology

I. Course Identification and General Information:

1	Course Title:	Pathophysiology				
2	Course Code & Number:	PHA326				
3	Credit hours:	C.H				Total
		Th.	Seminar	practical	Training.	
		2				2
4	Study level/ semester at which this course is offered:	Third Year, First Semester				
5	Pre –requisite (if any):	Physiology (2)				
6	Co –requisite (if any):					
7	Program (s) in which the course is offered:	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	Language of teaching the course:	English				
9	Study System	semester				
10	Mode of delivery:	Regular				
11	Location of teaching the course:	University campus				
12	Prepared By:	Dr. Waheed A M Alsowaidy				

II. Course Description:

Upon successful completion of this course, the students will be able to understand the basic knowledge of functional disturbances contributing to disorders of cell injury, inflammation and immune response, autonomic nervous system in health and disease, endocrine disorders, pancreatic disorders, fluid and electrolyte imbalance, vascular and hematological disorders, disease of urinary, pulmonary and digestive systems.

III. Course Objectives:

Upon successful completion of this course, the students will be able to:

- Recognize the pathophysiology of the different human systems and its etiology.
- Discuss the clinical manifestations of diseases.
- Correlate the symptoms and progression of diseases with the pathophysiology of these diseases.
- Apply the knowledge of the disease to interpret clinical data and design treatment plan.

IV. Course Intended learning outcomes (CILOs) of the course		WRITE Symbo and number o PILOs
a.1	Understand the basic pathophysiological processes including inflammation, cellular injury and mechanisms of repair and accommodation.	**A1**
a.2	Describe the etiology, clinical manifestations and rational of treatment of some common diseases	**A3**
b.1	Predict the effect of certain factors or management on diseases progression based on their pathophysiological knowledge	**B1**
b.2	Use the pathophysiological knowledge and appropriate researches to expect what kind of complication can result from certain disorders.	**B3**
b.3	Apply the knowledge of the disease to interpret clinical data and design treatment plan.	**B1**
d.1	Work independently and as a part of a teamwork to participate in community health promotion	**D1**
d.2	Deal with internet in research and communications	**D1**

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d.1 Understand the basic pathophysiological processes including inflammation, cellular injury and mechanisms of repair and accommodation.	Interactive lectures Discussion	Written Exam Assignments
d.2 Describe the etiology, clinical manifestations and rational of treatment of some common diseases	Interactive lectures Discussion Case studies	Written Exam Assignments Case studies

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1- Predict the effect of certain factors or management on diseases progression based on their pathophysiological knowledge	Interactive lectures Group discussion Assignments Case studies	Written Exam Assignments Case studies
b2- Use the pathophysiological knowledge and appropriate researches to expect what kind of complication can result from certain pathophysiological disorders.	Group discussion Assignments	Seminar presentation evaluation Assignments
b3- Apply the knowledge of the disease to interpret clinical data and design treatment plan.	Interactive lectures Group discussion Assignments Case studies	Written Exam Assignments Case studies

© Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1- Work independently and as a part of a teamwork to participate in community health promotion	Groups home works Cooperative and Self learning	Home works evaluation
d2- Deal with internet in research and communications	Field visit	Field visit reports

V. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	contact hours
1	Introduction to pathophysiology	a.1, a.2	- Atrophy, hypertrophy and hyperplasia. - Degeneration, necrosis and gangrene. - Fever	1	2
2	Pathophysiology of the blood	a.1, a.2, b.1, b.2, b.3	- Hypoproteinemia - Incompatible blood transfusion - Anemia. - Bleeding disorders - Leukemia - Allergy.	2	4
3	Pathophysiology of the cardiovascular system (heart)	a.1, a.2, b.1, b.2, b3	- Arrhythmias - Valvular diseases - Cardiomyopathy - Coronary heart disease - Cardiac tamponade - Rheumatic fever. - Heart failure.	2	4
4	Pathophysiology of the cardiovascular system (vessels)	a.1, a.2, b.1, b.2, b3	- Atherosclerosis. - Hypertension - Varicose veins - Deep Venus thrombosis - Edema - Shock	1	2
5	Pathophysiology of respiratory system	a.1, a.2, b.1, b.2, b3	- Obstructive lung diseases - Pleural effusion - Pneumothorax - Infantile and adult respiratory distress syndrome - Pulmonary edema - Respiratory failure.	1	2
6	**Med-term Exam**	a.1, a.2, b.1, b.2, b3, d.1, d.2		1	2
7	Pathophysiology of the digestive system	a.1, a.2, b.1, b.2, b3	- Peptic ulceration - Vomiting, Diarrhea and Constipation - Irritable bowel syndrome - Hepatitis, jaundice, liver	2	4

			cirrhosis and liver cell failure.		
8	Pathophysiology of the endocrine system	a.1, a.2, b.1, b.2, b3	- Gigantism. - Acromegaly. - Dwarfism, - Diabetes mellitus - Hypoparathyroidism. - Hypo and hypercorticism	2	4
9	Pathophysiology of the renal system	a.1, a.2, b.1, b.2, b3	Renal failure (types, manifestation and complication).	1	2
10	Pathophysiology of the nervous system	a.1, a.2, b.1, b.2, b3	- Upper motor neuron lesion - Lower motor neuron lesion - Parkinsonism - Cerebellar ataxia, aphasia	1	2
11	Miscellaneous disorders	a.1, a.2, b.1, b.2, b3	- Fever-heat stroke-Hypthermia - Obesity- starvation	1	2
12	**Final Exam**	a.1, a.2, b.1, b.2, b3, d.1, d.2		1	2
Number of Weeks /and Units Per Semester				**16**	**32**

B - Practical Aspect:

Order	Tasks/ Experiments	Number of Weeks	contact hours	Learning Outcomes
1				
2				
Number of Weeks /and Units Per Semester				

VI. Teaching strategies of the course:

Interactive lectures
Discussion
Assignments
Problem-based learning and Case studies
Groups home works
Cooperative and Self learning
Field visit

VII. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Home works	a.1, a.2, b.1, b.2, b3, d.1	5th and 10th	5
2	Field visits reports	a.1, a.2, b.1, b.2, b3, d.1	13th	5
3	Midterm Exam	a.1, a.2, b.1, b.2, b3, d.1,d.2	8th	20
3	Final Exam	a.1, a.2, b.1, b.2, b3, d.1,d.2	16th	70

VIII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Home works	5th and 10th	5	5%	a.1, a.2, b.1, b.2, b3, d.1
2	Field visits reports	13th	5	10%	a.1, a.2, b.1, b.2, b3, d.1
3	Midterm Exam	8th	20	5%	a.1, a.2, b.1, b.2, b3, d.1,d.2
4	Final Exam	16th	70	70%	a.1, a.2, b.1, b.2, b3, d.1,d.2
5	Total		100	100%	

IX. Learning Resources:

1- Required Textbook(s) (maximum two).

1- Carol Mattson Porth. 2011. Essentials of Pathophysiology: Concepts of Altered Health States. 4th ed. Lippincott Williams & Wilkins,
2- Laurie K. McCorry, Martin M. Zdanowicz and Cynthia Y. Gonnella. 2019. Essentials of Human Physiology and Pathophysiology for Pharmacy and Allied Health. Taylor & Francis.

2- Essential Refere

1- Sue E. Huether, Kathryn L. McCance. 2013. Understanding Pathophysiology 5th , Kindle Edition,
2-Gary D. Hammer, Stephen J. McPhee. 2014. Pathophysiology of Disease: An Introduction to Clinical Medicine 7/E.
3- Atlas of pathophysiology, 3rd edition. Lippincot Wiliams and Wilkins, 2011

3- Electronic Materials and Web Sites *etc.*

- American physiological society APS. http://www.the- aps.org/Default.aspx

X. Course Policies:

1 Class Attendance:

- At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam

2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects**: - Assignments and projects will be assessed individually unless the teacher request for group work
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the faculty rules.
7	**Other policies**: -

Template for Course Plan (Syllabus) of Pathophysiology

I. - Information about Faculty Member Responsible for the Course:

Name of Faculty Member	Dr. Waheed A M Alsowaidy	Office Hours					
Location& Telephone No.	Taiz City; Yemen 773425333	SAT	SUN	MON	TUE	WED	THU
E-mail	Waheed22sr@gmail.com	6		6		6	

II. Course Identification and General Information:

1	Course Title:	Pathophysiology				
2	Course Number & Code:	PHA326				
3	Credit hours:	C.H				Total
		Th.	Seminar	Pr.	F. Tr.	
		2				2
4	Study level/year at which this course is offered:	Third Level, Second Semester				
5	Pre –requisite (if any):	Physiology (2)				
6	Co –requisite (if any):					
7	Program (s) in which the course is offered	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	Language of teaching the course:	English				
9	System of Study:	Semester				
10	Mode of delivery:	Regular				
11	Location of teaching the course:	University campus				

III. Course Description:

Upon successful completion of this course, the students will be able to understand the basic knowledge of functional disturbances contributing to disorders of cell injury, inflammation and immune response , autonomic nervous system in health and disease , endocrine disorders , pancreatic disorders , fluid and electrolyte imbalance, vascular and hematological disorders , disease of urinary, pulmonary and digestive systems.

IV. Course Objectives:

Upon successful completion of this course, the students will be able to:
- Recognize the pathophysiology of the different human systems and its etiolog.
- Discuss the clinical manifestations of diseases.
- Correlate the symptoms and progression of diseases with the pathophysiology of these diseases.
- Apply the knowledge of the disease to interpret clinical data and design treatment plan.

V. Intended learning outcomes (ILOs) of the course:

Brief summary of the knowledge or skill the course is intended to develop:

1- Understand the basic pathophysiological processes including inflammation, cellular injury and mechanisms of repair and accommodation.

2- Describe the etiology, clinical manifestations and rational of treatment of some common diseases.

3- Predict the effect of certain factors or management on diseases progression based on their pathophysiological knowledge.

4- Use the pathophysiological knowledge and appropriate researches to expect what kind of complication can result from certain disorders.

5- Apply the knowledge of the disease to interpret clinical data and design treatment plan.

6- Work independently and as a part of a teamwork to participate in community health promotion

7- Deal with internet in research and communications.

VI. Course Content:

- Distribution of Semester Weekly Plan of Course Topics/Items and Activities.

A – Theoretical Aspect:

Order	Topics List	Week Due	Contact Hours
1	Introduction to pathophysiology	1st	2
2	Pathophysiology of the blood	2nd,3rd	4
3	Pathophysiology of the cardiovascular system (heart)	4th,5th	4
4	Pathophysiology of the cardiovascular system (vessels)	6th	2

5	Pathophysiology of respiratory system	7th	2
6	**Med-term Exam**	8th	2
7	Pathophysiology of the digestive system	9th,10th	4
8	Pathophysiology of the endocrine system	11th,12th	4
9	Pathophysiology of the renal system	13th	2
10	Pathophysiology of the nervous system	14th	2
11	Miscellaneous disorders	15th	2
12	**Final Exam**	16th	2
Number of Weeks /and Units Per Semester		**16**	**32**

B – Practical Aspect: ***(if any)***			
Order	**Topics List**	**Week Due**	**Contact Hours**
1			
3			
Number of Weeks /and Units Per Semester			

VII. Teaching strategies of the course:

Interactive lectures
Discussion
Assignments
Problem-based learning and Case studies
Groups home works
Cooperative and Self learning
Field visit

VIII. Assignments:

No	Assignments	Week Due	Mark
1	Participation, Home works	5th and 10th	5
2	Med-term Exam	13th	5
3	Field visits reports	8th	20
4	Final Exam	16th	70

IX. Schedule of Assessment Tasks for Students During the Semester:

Assessment	Type of Assessment Tasks	Week Due	Mark	Proportion of Final Assessment
1	Participation, Home works	5th and 10th	5	5%
2	Med-term Exam	13th	5	5%
3	Field visits reports	8th	20	20%
4	Final Exam	16th	70	70%
5	Total		100	100%

X. Learning Resources:

1- Required Textbook(s) (maximum two).

1- Carol Mattson Porth. 2011. Essentials of Pathophysiology: Concepts of Altered Health States. 4th ed. Lippincott Williams & Wilkins,

2- Laurie K. McCorry, Martin M. Zdanowicz and Cynthia Y. Gonnella. 2019. Essentials of Human Physiology and Pathophysiology for Pharmacy and Allied Health. Taylor & Francis.

2- Essential References.

1- Sue E. Huether, Kathryn L. McCance. 2013. Understanding Pathophysiology 5th , Kindle Edition,

2-Gary D. Hammer, Stephen J. McPhee. 2014. Pathophysiology of Disease: An Introduction to Clinical Medicine 7/E.

3- Atlas of pathophysiology, 3rd edition. Lippincot Wiliams and Wilkins, 2011

3- Electronic Materials and Web Sites *etc*.

- American physiological society APS. http://www.the- aps.org/Default

	XI. Course Policies:
1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam.
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** - Assignments and projects will be assessed individually unless the teacher request for group work.
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course.
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:**

Course Specification of Medicinal chemistry (1)

I. Course Identification and General Information:

1	Course Title:	Medicinal chemistry (1)				
2	Course Code & Number:	PHA332				
3	Credit hours:	C.H				TOTAL
		Th.	Seminar	practical	Training.	
		2			-	2
4	Study level/ semester at which this course is offered:	3 rd year / 1st semester				
5	Pre –requisite (if any):	Pharmaceutical Organic Chemistry				
6	Co –requisite (if any):	None				
7	Program (s) in which the course is offered:	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	Language of teaching the course:	English Language				
9	Study System	Semester				
10	Mode of delivery:	Regular				
11	Location of teaching the course:	University				
12	Prepared By:	Mohammed Hassan				

II. Course Description:

The course is concerned with the providing of fundamental knowledge about the pharmaceutical chemistry including, drug design, receptor, drug-receptor interaction, prodrugs, metabolism and physicochemical properties of drug.
Also concerned with chemical structure, synthesis, classification, metabolism, uses and structure activity relationship (SAR) of drugs affecting autonomic nerves system, antihistamine and Non-Steroidal Anti-Inflammatory Drugs (NSAIDs).

III. Course Objectives:

This course aims to:

1. Provide students basic information about physicochemical properties, metabolism and prodrugs.
2. Educate students the chemical structure, synthesis, mode of action and structure activity relationship (SAR) of drugs affecting ANS, antihistamine and NSAIDs
3. Comprehending the relationship between the chemical structure of these drugs and their physicochemical properties, pharmacokinetics, biological activity, together with their mode of action.
4. Learn students the skills in drug design using SAR.

IV. Course Intended learning outcomes (CILOs) of the course		WRITE Symbol ar number of PILC
After completing this course, students will be able to:		
a.1	Demonstrate knowledge about the basic definitions and principles of drug design, ligand, receptor, drug-receptor interaction and prodrug	A2, A3
a.2	Explain the physicochemical properties of drugs and their relationship to molecular structure	A2, A3
a.3	Recognize the possible metabolic pathways, chemical synthesis and the structure-activity relationship (SAR) for of each category in the course.	A2, A3
b.1	Relate between the structure and physicochemical properties of selected drugs with their activity	B1
b.2	Predict the metabolic pathways of selected drugs based on their chemical structures	
c.1	Modify the chemical structure of a given drug to control relative onset and duration of action based on drug chemistry.	C1
c.2	Counsel the patients about proper use of studied drugs and prescribe therapeutic recommendations based on an understanding of drug chemistry	C4
d.1	Demonstrate critical thinking, decision making, communication and cooperation skills.	D1

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
After completing this course, students will be able to:	- Lectures - Groups discussion - Computer based teaching and learning. - Assignments	- In-class participation - Quizzes - Assignments - Written exam.
a1. Demonstrate knowledge about the basic definitions and principles of drug design, ligand, receptor, drug-receptor interaction and prodrug		
a2. Explain the physicochemical properties of drugs and their relationship to molecular structure		
a3. Recognize the possible metabolic pathways,		

chemical synthesis and the structure-activity relationship (SAR) for of each category in the course.		

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
After completing this course, students will be able to:	- Lectures - roups discussion. - Problem solving Sessions.	- In-class participation - Quizzes - Written exam. - Problem Solving Exercise
b1. Relate between the structure and physicochemical properties of selected drugs with their activity		
b2. Predict the metabolic pathways of selected drugs based on their chemical structures		

(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
After completing this course, students will be able to:	- group discussion. - Simulated software programs. - case study	- Assignments & Coursework Activities
c1. Modify the chemical structure of a given drug to control relative onset and duration of action based on drug chemistry.		
c2. Counsel the patients about proper use of studied drugs and prescribe therapeutic recommendations based on an understanding of drug chemistry		

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
After completing this course, students will be able to:	- Group discussions. - Research in library and web. - Self –learning	- Oral Presentation & discussion - Homework Evaluation. - Reports' Evaluation.
d1- Demonstrate critical thinking, decision making, communication and cooperation skills.		

V. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Learning Outcomes	Sub Topics List	No. of Weeks	contact hours
1	Introduction to medicinal chemistry	a1, b1, d1	- Definitions, principles and orientation related to medicinal chemistry - Receptor, ligand, pharmacophore, drug-receptor interaction - Classification of drugs	1	2
2	physicochemical properties of drug	a1, a3, b1, c1, d1	Solubility, lipophilicity, log p, pka, bonds, steric factor, electronic effect, bioisoster and others	2	4
3	Prodrug	a1, a2, a3, b1, b2, c1, d1	Definitions, types, applications of prodrug	1	2
4	Drug metabolism	a1, a3, b2 , c1, d1	Definitions, site and pathways of metabolism, phase 1, phase 11, factors affecting metabolism	3	6
5	Midterm	a1, a2, a3, b1, b2 c1		1	2
6	Sympathomimetic drugs	a1, a2, a3, b1, b2, c1, c2, d1	Classification, SAR, biosynthesis, synthesis, metabolism, uses	2	4
7	Sympatholytic drugs	a2, a3, b1, b2, c1, c2, d1	Classification, SAR, synthesis, metabolism, uses	1	2
8	Parasympathomimetic drugs	a2, a3, b1, b2, c1, c2, d1	Classification, SAR, biosynthesis, synthesis, metabolism, uses	1	2
9	Parasympatholytic drugs	a2, a3, b1, b2, c1, c2, d1	Classification, SAR, synthesis, metabolism, uses	1	2
10	Anti-histamines	a2, a3, b1, b2, c1, c2, d1	H1 anti-histamines H2 anti-histamines, SAR, synthesis, metabolism, uses	1	2
11	Non-Steroidal Anti-Inflammatory Drugs	a2, a3, b1, b2,	Classification, SAR, synthesis, metabolism, uses	1	2

	(NSAIDs)	c1, c2, d1			
12	Final exam	a1, a2, a3, b1, b2, c1, c2		1	2
Number of Weeks /and Units Per Semester				**16**	**32**

VI. Teaching strategies of the course:

- Lectures
- Groups discussion
- Computer based teaching and learning.
- Assignments
- Problem solving Sessions.
- Simulated software programs.
- Case study
- Research in library and web.
- Self –learning

VII. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Activities	b1, b2, c1, c2, d1	Every 2 weeks	5

VIII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Assignments	Every 2 weeks	5	5%	b1, b2, c1, c2, d1
2	Quizzes	4	5	5%	a1, a2, a3, b1, b2
3	Mid-Term Exam	8	20	20%	a1,a2,a3,b1,b2,b3
4	Final Exam	16	70	70%	a1, a2, a3, b1, b2, c1, c2
5	**Total**		**100**	**100%**	

IX. Learning Resources:

1- Required Textbook(s) (maximum two).

1- John M. Beale, Jr. and John H. Block, 2011, "Text book of Organic Medicinal and Pharmaceutical Chemistry" 12th Edition, Wilson and Gisvold, Lippincott Williams and Wilkins, A Wolters Kluwer Company, Philadelphia.
2- Graham L. Patrick, 2017, "An Introduction to Medicinal Chemistry" 5th Edition, Oxford University Press Inc, New York.

2- Essential References.

1- Thomas L. Lemke, Victoria F. Roche, David A. Willaiams and S. William Zito, 2008, "Foye's Principles of Medicinal Chemistry" 6 th, Edition,., Lippincott Williams & Wilkins, a Wolters Kluwer business, Philadelphia.
2- Thomas Nogrady, Donald F. Weaver, 2005, Medicinal Chemistry A Molecular and Biochemical Approach, 3rd edition, Oxford University Press, Inc., New York.
3- Donald J. Abraham," BURGER'S Medicinal Chemistry and Drug Discovery" 6 th edition, A John Wiley and Sons, Inc, Virginia.

3- Electronic Materials and Web Sites *etc*.

1- www. Pharmchem. Ku.edu/
2- http://www.chemaxon/marvin
3- http://www.webmolecules.com
4-http://www.acdlabs.com
5-PASS Prediction of Activity Spectra for Substance) (http://www.ibmh.msk.su/PASS

X. Course Policies:

1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects**:

	- Assignments and projects will be assessed individually unless the teacher request for group work
5	**Cheating:** - Cheating by any means will cause the student failure and he/she must re-study the course
6	**Plagiarism:** Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:** -

Template for Course Plan (Syllabus) of Medicinal chemistry (1)

I. - Information about Faculty Member Responsible for the Course:

		Office Hours					
Name of Faculty Member							
Location& Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Identification and General Information:

1	Course Title:	Medicinal chemistry (1)				
2	Course Code & Number:	**PHA332**				
3	Credit hours:	C.H				TOTAL
		Th.	Seminar	practical	Training.	
		2			-	2
4	Study level/ semester at which this course is offered:	3 rd year / 1st semester				
5	Pre –requisite (if any):	Pharmaceutical organic chemistry				
6	Co –requisite (if any):	None				
7	Program (s) in which the course is offered:	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	Language of teaching the course:	English Language				
9	Study System	Semester				
10	Mode of delivery:	Regular				
11	Location of teaching the course:	University				
12	Prepared By:	Mohammed Hassan				

III. Course Description:

The course is concerned with the providing of fundamental knowledge about the pharmaceutical chemistry including, drug design, receptor, drug-receptor interaction, prodrugs, metabolism and physicochemical properties of drug.

Also concerned with chemical structure, synthesis, classification, metabolism, uses and structure activity relationship (SAR) of drugs affecting autonomic nerves system, antihistamine and Non-Steroidal Anti-Inflammatory Drugs (NSAIDs).

IV. Course Objectives:

This course aims to:

1. Provide students basic information about physicochemical properties, metabolism and prodrugs.
2. Educate students the chemical structure, synthesis, mode of action and structure activity relationship (SAR) of drugs affecting ANS, antihistamine and NSAIDs
3. Comprehending the relationship between the chemical structure of these drugs and their physicochemical properties, pharmacokinetics, biological activity, together with their mode of action.
4. Learn students the skills in drug design using SAR.

V. Course Intended learning outcomes (CILOs) of the course

After completing this course, students will be able to:

1	Demonstrate knowledge about the basic definitions and principles of drug design, ligand, receptor, drug-receptor interaction and prodrug
2	Explain the physicochemical properties of drugs and their relationship to molecular structure
3	Recognize the possible metabolic pathways, chemical synthesis and the structure-activity relationship (SAR) for of each category in the course.
4	Relate between the structure and physicochemical properties of selected drugs with their activity
5	Predict the metabolic pathways of selected drugs based on their chemical structures
6	Modify the chemical structure of a given drug to control relative onset and duration of action based on drug chemistry.
7	Counsel the patients about proper use of studied drugs and prescribe therapeutic recommendations based on an understanding of drug chemistry
8	Demonstrate critical thinking, decision making, communication and cooperation skills.

VI. Course Content:

A – Theoretical Aspect:

Order	Topics List	Week Due	Contact Hours
1	**Introduction to medicinal chemistry**	**W1**	**2**

	▪ Definitions, principles and orientation related to medicinal chemistry ▪ Receptor, ligand, pharmacophore, drug-receptor interaction ▪ Classification of drugs		
2	**Physicochemical properties of drug** ▪ Solubility, lipophilicity, log p, pka, bonds, electronic effect, steric factor, bioisoster and others	**W2, W3**	**4**
3	**Prodrug and drug latenation** ▪ Definitions, types, applications of prodrug	**W4**	**2**
4	**Drug metabolism** ▪ Definitions, site and pathways of metabolism, ▪ Phase I, phase II metabolism ▪ Factors affecting metabolism	**W5, W6, W7**	**6**
5	**Midterm**	**W8**	**2**
6	**Sympathomimetic drugs** ▪ Classification, SAR, biosynthesis, synthesis, metabolism, uses	**W9, W10**	**4**
7	**Sympatholytic drugs** ▪ Classification, SAR, synthesis, metabolism, uses	**W11**	**2**
8	**Parasympathomimetic drugs** ▪ Classification, SAR, biosynthesis, synthesis, metabolism, uses	**W12**	**2**
9	**Parasympatholytic drugs** ▪ Classification, SAR, synthesis, metabolism, uses	**W13**	**2**
10	**Anti-histamines** ▪ H1 anti-histamines ▪ H2 anti-histamines, SAR, synthesis, metabolism	**W14**	**2**
11	**Anti-inflammatory agents** ▪ Classification, SAR, synthesis, metabolism	**W15**	**2**
12	**Final exam**	**W16**	**2**
Number of Weeks /and Units Per Semester		**16**	**32**

VII. Teaching strategies of the course:

- Lectures
- Groups discussion
- Computer based teaching and learning.
- Assignments
- Problem solving Sessions.
- Simulated software programs.
- Case study
- Research in library and web.
- Self –learning

VIII. Assignments:

No	Assignments	Week Due	Mark
1	Activities	Every 2 weeks	5

IX. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment
1	Assignments	Every 2 weeks	5	5%
2	Quizzes	4	5	5%
3	Mid-Term Exam	8	20	20%
5	Final Exam	16	70	70%
6	**Total**		**100**	**100%**

X. Learning Resources:

1- Required Textbook(s) (maximum two).

1- John M. Beale, Jr. and John H. Block, 2011, "Text book of Organic Medicinal and Pharmaceutical Chemistry" 12th Edition, Wilson and Gisvold, Lippincott Williams and Wilkins, A Wolters Kluwer Company, Philadelphia.
2- Graham L. Patrick, 2017, "An Introduction to Medicinal Chemistry" 5th Edition, Oxford University Press Inc, New York.

2- Essential Referen

1- Thomas L. Lemke, Victoria F. Roche, David A. Willaiams and S. William Zito, 2008,

	"Foye's Principles of Medicinal Chemistry" 6 th, Edition,., Lippincott Williams & Wilkins, a Wolters Kluwer business, Philadelphia. **2-** Thomas Nogrady, Donald F. Weaver, 2005, Medicinal Chemistry A Molecular and Biochemical Approach, 3rd edition, Oxford University Press, Inc., New York. **3-** Donald J. Abraham," BURGER'S Medicinal Chemistry and Drug Discovery" 6 th edition, A John Wiley and Sons, Inc, Virginia.
3- Electronic Materials and Web Sites *etc*.	
	1- www. Pharmchem. Ku.edu/ 2- http://www.chemaxon/marvin 3- http://www.webmolecules.com 4-http://www.acdlabs.com 5-PASS Prediction of Activity Spectra for Substance) (http://www.ibmh.msk.su/PASS).

	XI. Course Policies:
1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam.
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** - Assignments and projects will be assessed individually unless the teacher request for group work.
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course.
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:**

Course Specification of Parasitology

VIII. Course Identification and General Information:

1	Course Title:	Parasitology				
2	Course Code & Number:	PHA344				
3	Credit hours:	C.H				TOTAL
		Th.	Seminar	practical	Training.	
		2 hrs	No	1 hr	No	3 hrs
4	Study level/ semester at which this course is offered:	Third level, first semester				
5	Pre –requisite (if any):	General Microbiology				
6	Co –requisite (if any):	None				
7	Program (s) in which the course is offered:	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	Language of teaching the course:	English				
9	Study System	Semester				
10	Mode of delivery:	Regular				
11	Location of teaching the course:	University campus				
12	Prepared By:	Dr. Mohammed Al-Taj				

II. Course Description:

This course focuses on helminth and protozoan parasites causing humans diseases. The identification, classification, morphology, life cycles, epidemiology, pathogenicity, drug treatments, the host-parasite relationship, and vector control programs of parasites belonging to helminths and protozoa are covered in this course. This course provides an overview of the human parasites and their diseases. Topics include the basic concept of helminth parasite classes: Trematoda, Cestoda and Nematoda; as well as protozoa-Sarcodina, Flagellates, Ciliates and Sporozoa. It also gives a brief list about the medical arthropods which are related directly with the previous parasites and considered as vectors.

III. Course Objectives:

1. To provide students with adequate knowledge about endemic parasites, national parasitic problems and common parasites worldwide.
2. To provide student with knowledge concerning biological, epidemiological and ecological aspects of parasites causing diseases to humans.
3. To enable students to be familial with the pathogenesis, clinical presentations and

complications of parasitic infections.

4. To help the students to know the general outline of treatment, the best drug of choice, prevention and control of parasitic diseases.
5. To develop students' knowledge about endemic parasitic problems and their impact upon health.

IV. Course Intended learning outcomes (CILOs) of the course: At the end of the course, students should be able to:		WRITE Symbol and number o PILOs
a.2	Mention the classification, types of parasites, and types of hosts, host parasite relationship, etiology, epidemiology and clinical features of different parasitic diseases.	A1
a.2	Identify common arthropods of medical interest and recognize their medical importance and methods of combat.	A4
b.1	Select appropriate methods of infection control to prevent infections and promote public health.	B3
b.2	Apply the therapeutic principles in the proper selection and use of drugs in various parasitic disease conditions.	B4
c.1	Select the appropriate medication therapy for a given diseases based on its etiology, pathophysiology, patient medical history, possible interactions and age-related factors.	C1
c.2	Evaluate the selected drug therapy based on patient's progress and laboratory results.	C4
c.3	.Provide advices to patients, their families, community and other health care professionals about safe and rational use of anti-parasitic medications.	C2
d.1	Demonstrate critical thinking and decision-making abilities in a variety of theoretical and practical situations.	D3

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1- Mention the classification, types of parasites, and types of hosts, host parasite relationship, etiology, epidemiology and clinical features of different parasitic diseases.	Power Point Presentation, Interactive lecture, Group discussion	Assignments, reports, written exam, oral exam

a2- Identify common arthropods of medical interest and recognize their medical importance and methods of combat.	Power Point Presentation, Interactive lecture, Group discussion	Assignments, reports, written exam, oral exam

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1- Select appropriate methods of infection control to prevent infections and promote public health.	Power Point Presentation, Interactive lecture, Group discussion	Assignments, reports, written exam, oral exam
b2- Apply the therapeutic principles in the proper selection and use of drugs in various parasitic disease conditions.	Power Point Presentation, Interactive lecture, Group discussion Case Studies	Assignments, reports, written exam, oral exam Case Studies

(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1- Select the appropriate medication therapy for a given diseases based on its etiology, pathophysiology, patient medical history, possible interactions and age-related factors.	Presentation, Slides examination, Group discussion and Activities Case Studies	Assignments, reports, written exam, oral exam Case Studies
c2- Evaluate the selected drug therapy based on patient's progress and laboratory results.	Presentation, Slides examination, Group discussion and Activities Practical classes	Assignments, reports, written exam, oral exam Practical exam
c3- Provide advices to patients, their families, community and other health care professionals about safe and rational use of anti-parasitic medications.	Presentation, Slides examination, Group discussion and Activities Practical classes, Case Studies	Assignments, reports, written exam, oral exam Practical exam. Case Studies.

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1- Demonstrate critical thinking and decision-making abilities in a variety of theoretical and practical situations.	Presentation, Slides examination, Group discussion and Activities	Assignments, reports, written exam, oral exam

V. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	contact hours
1	Introduction to parasitology	a1,a2, b1	General definitions , types of parasites, types of hosts, translation, sourses of infection, life cycle, parasite-host relationship, pathogenesis, diagnosis, treatment, prevention and control	1	2
2	Introduction to helminthology and Hepatic flukes	a1,a2, b1, b2	Introduction, classification, morphology, epidemiology, life cycle, pathogenesis, symptoms, diagnosis, treatment, prevention and control.	1	2
3	Intestinal flukes and Blood flukes	a1,a2, b1,b2	Classification, morphology, epidemiology, life cycle, pathogenesis, symptoms, diagnosis, treatment, prevention and control.	1	2
4	Introduction to cestodes and,*Taenia* app.	a1,a2, b1,b2	Introduction, classification, morphology, epidemiology, life cycle, pathogenesis, symptoms, diagnosis, treatment, prevention and control.	1	2
5	Hydatid cyst & *Hymenolepis*	a1,a2, b1,b2	Classification, morphology, epidemiology, life cycle, pathogenesis, symptoms, diagnosis, treatment, prevention and control.	1	2
6	Introduction to nematodes & *Ascaris* and *Enterobius*	a1,a2, b1,b2	Introduction, classification, morphology, epidemiology, life cycle, pathogenesis, symptoms, diagnosis, treatment, prevention and control.	1	2
7	*Trichuris trichiura* and Hook worms	a1,a2, b1,b2	Classification, morphology, epidemiology, life cycle, pathogenesis, symptoms, diagnosis, treatment, prevention and control.	1	2
8	**Midterm Exam**		a1,a2, b1,b2	1	2
9	Introduction to protozoa and *Entamoeba* spp.	a1,a2, b1,b2	Introduction, classification, morphology, epidemiology, life cycle, pathogenesis, symptoms, diagnosis, treatment, prevention and control.	1	2
10	*Giardia* and *Trichomonas*	a1,a2, b1,b2	Classification, morphology, epidemiology, life cycle, pathogenesis, symptoms, diagnosis, treatment, prevention and control.	1	2
11	*Leishmania* spp.	a1,a2,	Classification, morphology,	2	4

	and *Trypanosoma* spp.	b1,b2	epidemiology, life cycle, pathogenesis, symptoms, diagnosis, treatment, prevention and control.		
12	Introduction to Apicomplexa Malaria and *Cryptosporidium*	a1,a2, b1,b2	Introduction, classification, morphology, epidemiology, life cycle, pathogenesis, symptoms, diagnosis, treatment, prevention and control.	1	2
13	*Toxoplasma* and *Balantidium*	a1,a2, b1,b2	Classification, morphology, epidemiology, life cycle, pathogenesis, symptoms, diagnosis, treatment, prevention and control.	1	2
14	Role played by arthropods in transmission of diseases.	a1, a2	Classification, identification, morphology, transmission diseases, prevention and control.	1	2
15	**Final Exam**	a1,a2, b1,b2		1	2
Number of Weeks /and Units Per Semester				**16**	**32**

B - Practical Aspect:

Order	Tasks/ Experiments	Number of Weeks	contact hours	Learning Outcomes
1	General and microscopic examination of Hepatic flukes	1	**2**	c1, c2, c3 ,d1
2	Microscopic examination of Intestinal and Blood flukes	1	**2**	c1, c2, c3 ,d1
3	Introduction to cestodes and microscopic examination of *Taenia* species	1	**2**	c1, c2, c3 ,d1
4	Microscopic examination of Hydatid cyst & *Hymenolepis* specie	1	**2**	c1, c2, c3 ,d1
5	Introduction to nematodes, microscopic examination of *Ascaris* and *Enterobius*	1	**2**	c1, c2, c3 ,d1
6	Microscopic examination of *Trichuris trichiura* and Hook worms	1	**2**	a1, c1, c2, c3 ,d1, d2
7	**Midterm Exam**	1	**2**	a1, c1, c2, c3 ,d1, d2
8	Introduction to protozoa and microscopic examination of *Entamoeba* spp.	1	**2**	c1, c2, c3 ,d1
9	Microscopic examination of *Giardia* and *Trichomonas*	1	**2**	c1, c2, c3 ,d1

10	Microscopic examination of *Leishmania* spp. and *Trypanosoma* spp.	1	**2**	c1, c2, c3 ,d1
11	Introduction to Apicomplexa and microscopic examination of *Plasmodium* spp. and *Cryptosporidium*	1	**2**	c1, c2, c3 ,d1
12	Microscopic examination of *Toxoplasma* and *Balantidium*	1	**2**	c1, c2, c3 ,d1
13	General Revision	1	**2**	a1, a2, b1, b2, c1, c2, c3 ,d1
14	**Final Exam**	1	**2**	a1, a2, b1, b2, c1, c2, c3 ,d1
Number of Weeks /and Units Per Semester		**14**	**28**	

VI. Teaching strategies of the course:

Power Point Presentation, Interactive lecture, Group discussion
Case Studies
Practical classes
Slides examination and Activities

VII. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Participation and homework assignments	a1, a2, b1, b2, c1, c2, c3 ,d1	Weekly	5

VIII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Participation and homework assignments	Weekly	5	5%	a1, a2, b1, b2, c1, c2, c3 ,d1
2	Quizzes	5, 12	5	5%	a1, a2, b1, b2, c1, c2, c3 ,d1
3	Practical/laboratory work and Practical notebook	1-13	10	10%	c1, c2, c3 ,d1
4	Midterm exam for theoretical	8	10	10%	a1, a2, b1, b2,

	part				d1
5	Final exam for practical part	14	30	30%	a1, b1, c1, c2, c3 ,d1
6	Final Exam for theoretical part	16	40	40%	a1, a2, b1, b2, c1, c2, c3 ,d1
	Total		**100**	**100%**	

IX. Learning Resources:

1- Required Textbook(s) (maximum two).

1. Paniker, J. C. K. and Ghosh, S. (2018): Paniker's Textbook of Medical Parasitolog. **8th** ed., Jaypee Brothers Medical Publishers (P) Ltd.

2- Essential References.

1. Jeffrey, H. C., Leach, R. M. and Cowan, G. O. (2002): Atlas of Medical Helminthology and Protozoology. 3rd ed., Churchil Livingstone.
2. Sastry, A.S. and Sandhya, B. K. (2014): Essentials of Medical Parasitolog. **1st** ed., Jaypee Brothers Medical Publishers (P) Ltd.

3- Electronic Materials and Web Sites *etc.*

1. www.Pubmed.com
2. www.abebooks.com
3. WWW.parasitesonline.net/homepage.htm.
4. WWW.parasitology.org.uk

X. Course Policies:

1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects**:

	- Assignments and projects will be assessed individually unless the teacher request for group work
5	**Cheating:** - Cheating by any means will cause the student failure and he/she must re-study the course
6	**Plagiarism:** Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:** -

Template for Course Plan (Syllabus) Parasitology

I. - Information about Faculty Member Responsible for the Course:

Name of Faculty Member		Office Hours					
Location& Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Identification and General Information:

Course Title:	Parasitology					
Course Number & Code:	PHA344					
Credit hours:	C.H					Total
	Th.	Seminar	Pr.	F. Tr.		
	2 hrs	No	1 hr	No		3 hrs
Study level/year at which this course is offered:	Third level, first semester					
Pre –requisite (if any):	General Microbiology					
Co –requisite (if any):	None					
Program (s) in which the course is offered	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)					
Language of teaching the course:	English					
System of Study:	Semester					
Mode of delivery:	Regular					
Location of teaching the course:	University campus					

III. Course Description:

This course focuses on helminth and protozoan parasites causing humans diseases. The identification, classification, morphology, life cycles, epidemiology, pathogenicity, drug treatments, the host-parasite relationship, and vector control programs of parasites belonging to helminths and protozoa are covered in this course. This course provides an overview of the human parasites and their diseases. Topics include the basic concept of helminth parasite classes: Trematoda, Cestoda and Nematoda; as well as protozoa-Sarcodina, Flagellates, Ciliates and Sporozoa. It also gives a brief list about the medical arthropods which are related directly with the previous parasites and considered as vectors.

IV. Course Objectives:

1- To provide students with adequate knowledge about endemic parasites, national parasitic problems and common parasites worldwide.
2- To provide student with knowledge concerning biological, epidemiological and ecological aspects of parasites causing diseases to humans.
3- To enable students to be familial with the pathogenesis, clinical presentations and complications of parasitic infections.
4- To help the students to know the general outline of treatment, the best drug of choice, prevention and control of parasitic diseases.
5- To develop students' knowledge about endemic parasitic problems and their impact upon health.

V. Intended learning outcomes (ILOs) of the course:

Brief summary of the knowledge or skill the course is intended to develop**:**

1. Mention the classification, types of parasites, and types of hosts, host parasite relationship, etiology, epidemiology and clinical features of different parasitic diseases.
2. Identify common arthropods of medical interest and recognize their medical importance and methods of combat.
3. Select appropriate methods of infection control to prevent infections and promote public health.
4. Apply the therapeutic principles in the proper selection and use of drugs in various parasitic disease conditions.
5. Select the appropriate medication therapy for a given diseases based on its etiology, pathophysiology, patient medical history, possible interactions and age-related factors.
6. Evaluate the selected drug therapy based on patient's progress and laboratory results.
7. .Provide advices to patients, their families, community and other health care professionals about safe and rational use of anti-parasitic medications.
8. Demonstrate critical thinking and decision-making abilities in a variety of theoretical and practical situations.

VI. Course Content:

- Distribution of Semester Weekly Plan of Course Topics/Items and Activities.

A – Theoretical Aspect:

Order	Topics List	Week Due	Contact Hours
1	**Introduction to parasitology:** General definitions , types of parasites, types of hosts, translation, sources of infection, life cycle, parasite-host	1st	2

	relationship, pathogenesis, diagnosis, treatment, prevention and control		
2	**Introduction to helminthology and Hepatic flukes:** Introduction, classification, morphology, epidemiology, life cycle, pathogenesis, symptoms, diagnosis, treatment, prevention and control.	2nd	2
3	**Intestinal flukes and Blood flukes:** Classification, morphology, epidemiology, life cycle, pathogenesis, symptoms, diagnosis, treatment, prevention and control.	3rd	2
4	**Introduction to cestodes and,*Taenia* app.:** Introduction, classification, morphology, epidemiology, life cycle, pathogenesis, symptoms, diagnosis, treatment, prevention and control.	4th	2
5	**Hydatid cyst & *Hymenolepis*:** Classification, morphology, epidemiology, life cycle, pathogenesis, symptoms, diagnosis, treatment, prevention and control.	5th	2
6	**Introduction to nematodes & *Ascaris* and *Enterobius*:** Introduction, classification, morphology, epidemiology, life cycle, pathogenesis, symptoms, diagnosis, treatment, prevention and control.	6th	2
7	***Trichuris trichiura* and Hook worms**: Classification, morphology, epidemiology, life cycle, pathogenesis, symptoms, diagnosis, treatment, prevention and control.	7th	2
8	**Midterm Exam**	8th	2
9	**Introduction to protozoa and *Entamoeba* spp.:** Introduction, classification, morphology, epidemiology, life cycle, pathogenesis, symptoms, diagnosis, treatment, prevention and control.	9th	2
10	***Giardia* and *Trichomonas*:** Classification, morphology, epidemiology, life cycle, pathogenesis, symptoms, diagnosis, treatment, prevention and control.	10th	2
11	***Leishmania* spp. and *Trypanosoma* spp.:** Classification, morphology, epidemiology, life cycle, pathogenesis, symptoms, diagnosis, treatment, prevention and control.	11th, 12th	4
12	**Introduction to Apicomplexa Malaria and *Cryptosporidium*:** Introduction, classification, morphology, epidemiology, life cycle, pathogenesis, symptoms, diagnosis, treatment, prevention and control.	13th	2
13	***Toxoplasma* and *Balantidium*:** Classification, morphology, epidemiology, life cycle, pathogenesis, symptoms, diagnosis, treatment, prevention and	14th	2

	control.		
14	**Role played by arthropods in transmission of diseases:** Classification, identification, morphology, transmission diseases, prevention and control.	15th	2
15	**Final Exam**	16th	2
Number of Weeks /and Units Per Semester		**16**	**32**

B – Practical Aspect:

Order	Topics List	Week Due	Contact Hours
1	Introduction to parasitology, helminthology and microscopic examination of Hepatic flukes	1st	2
2	Microscopic examination of Intestinal and Blood flukes	2nd	2
3	Introduction to cestodes and microscopic examination of *Taenia* species	3rd	2
4	Microscopic examination of Hydatid cyst & *Hymenolepis* specie	4th	2
5	Introduction to nematodes, microscopic examination of *Ascaris* and *Enterobius*	5th	2
6	Microscopic examination of *Trichuris trichiura* and Hook worms	6th	2
7	**Midterm Exam**	7th	2
8	Introduction to protozoa and microscopic examination of *Entamoeba* spp.	8th	2
9	Microscopic examination of *Giardia* and *Trichomonas*	9th	2
10	Microscopic examination of *Leishmania* spp. and *Trypanosoma* spp.	10th	2
11	Introduction to Apicomplexa and microscopic examination of *Plasmodium* spp. and *Cryptosporidium*	11th	2
12	Microscopic examination of *Toxoplasma* and *Balantidium*	12th	2
13	General Revision	13th	2
14	**Final Exam**	14th	2
Number of Weeks /and Units Per Semester		**14**	**28**

VII. Teaching strategies of the course:

Power Point Presentation, Interactive lecture, Group discussion
Case Studies
Practical classes
Slides examination and Activities.

VIII. Assignments:

No	Assignments	Week Due	Mark
1	Participation and homework assignments	weekly	5

IX. Schedule of Assessment Tasks for Students During the Semester:

Assessment	Type of Assessment Tasks	Week Due	Mark	Proportion of Final Assessment
1	Participation and homework assignments	Weekly	5	5%
2	Quizzes	5, 12	5	5%
3	Practical/laboratory work and Practical notebook	1-13	10	10%
4	Midterm exam for theoretical part	8	10	10%
5	Final exam for practical part	14	30	30%
6	Final Exam for theoretical part	16	40	40%
	Total		**100**	**100%**

X. Learning Resources:

- Written in the following order: (Author – Year of publication – Title – Edition – Place of publication – Publisher).

1- Required Textbook(s) (maximum two).

1- Paniker, J. C. K. and Ghosh, S. (2018): Paniker's Textbook of Medical Parasitolog. **8th** ed., Jaypee Brothers Medical Publishers (P) Ltd.

2- Essential References.

1- Jeffrey, H. C., Leach, R. M. and Cowan, G. O. (2002): Atlas of Medical Helminthology and Protozoology. 3rd ed., Churchil Livingstone.
2- Sastry, A.S. and Sandhya, B. K. (2014): Essentials of Medical Parasitolog. **1st** ed., Jaypee Brothers Medical Publishers (P) Ltd.

3- Electronic Materials and Web Sites *etc*.

1- www.Pubmed.com
2- www.abebooks.com
3- WWW.parasitesonline.net/homepage.htm.
4- WWW.parasitology.org.uk

XI. Course Policies:

1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2	**Tardy:** - Any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** - Assignments and projects will be assessed individually unless the teacher request for group work
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:** -

Course Specification of Immunology

I. Course Identification and General Information:

1	Course Title:	Immunology				
2	Course Code & Number:	PHA345				
3	Credit hours:	C.H				TOTAL
		Th.	Seminar	practical	Training.	
		2				2
4	Study level/ semester at which this course is offered:	Third year, first semester				
5	Pre –requisite (if any):	Pharmaceutical Microbiology				
6	Co –requisite (if any):	None				
7	Program (s) in which the course is offered:	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	Language of teaching the course:	English				
9	Study System	Semester				
10	Mode of delivery:	Regular				
11	Location of teaching the course:	Faculty of medical and Health sciences, Al-Saeed University.				
12	Prepared By:	Dr. Waheed A M Alsowaidy				

II. Course Description:

This course will explore the main principles in immunology and vaccination. The first part of the course begins by covering the basic structures of the human immune system, and then move on to look at ways of interaction between immune cells to produce an immune response. The role of the immune system will be studied in the following cases: infectious diseases, cancer, allergy, transplantation, and vaccination. The second part begins with the principles of vaccination, and then the Types of vaccines and their mechanisms of action.

III. Course Objectives:

- To introduce students to the basic concepts in immunology.
- To understand the mechanisms of action of innate and acquired immunity.
- To correlate between different immune cells and their role in the immune system.
- To explain vaccine's production types, effects, mechanisms of action and the newly emergent vaccines.

IV. Course Intended learning outcomes (CILOs) of the course		WRITE Symbol an number of PILO
a.1	Identify the components of innate and acquired (humeral, and cell mediated) immune responses and describe the role of immune cell in the immune response.	A1
a.2	Explain mechanisms of production, types and efficacy of antibodies and vaccines and their mechanisms of action.	A2, A2
b.1	Evaluate the usefulness, and the efficacy of the different types of antibodies and vaccines.	B1
b.2	Use appropriate research methods to analyze the characteristics and functional features of the immune response ant it interaction with immune modulating drugs.	B3
c.1	Provide information to the patients about the mechanisms and avoidance of undesirable immune reactions to certain drugs.	C2, C4
d.1	Interact with health authorities and with the community and use the immunological knowledge to predict consequences in immune disorders.	D1, D3

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1- Identify the components of innate and acquired (humeral, and cell mediated) immune responses and describe the role of immune cell in the immune response..	Lectures Discussion Assignments Videos	Assignments Written exam
a2- Explain mechanisms of production, types and efficacy of antibodies and vaccines and their mechanisms of action.	Lectures Discussion Assignments	Assignments Written exam

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1- Evaluate the usefulness, and the efficacy of the different types of antibodies and vaccines.	Lectures Discussion Assignments	Assignments Written exam
b2- Use appropriate research methods to analyze the characteristics and functional features of the immune response ant it interaction with immune modulating drugs.	Lectures Discussion Assignments	Assignments Written exam

© Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1- Provide information to the patients about the mechanisms and avoidance of undesirable immune reactions to certain drugs.	Problem-based learning and Case studies	Problem solving exercises and case studies

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1- Interact with health authorities and with the community and use the immunological knowledge to predict consequences in immune disorders.	Discussion Role play Field visit	Observation, Assignments Field visit report

V. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	contact hours
1	- Immunology Introduction - Innate and acquired immune response	a1	- Innate/acquired immunity - Elements and cells of innate and acquired immunity - Different Mechanisms of innate immune response - Inflammation	1	2
2	- Immunogens and antigens - Primary and secondary lymphoid organs	a1, a2, b.1	- Immunogens and antigens - Immunogenicity recruitments and Adjuvants - Primary and secondary lymphoid organs - Interaction between innate and acquired immune responses	1	2
3	- Cell mediated immunity	a1, a2,b.2,	- General characteristics - T cells production and maturation - T cell subpopulations and their main functions - Antigen processing and presentation - Cytokines and its effects in immune response	2	4
4	- Humoral immunity	a1, a2, b1,b.2, c.1, d.1	- General characteristics - B cells production maturation and activation - Antibodies structure and function - Antigen-antibody reaction - Immunoassay (specificity, cross reactivity) - Primary and secondary immune response	2	4
5	- Monoclonal antibodies - Adjuvants	a1, b.2,c1	- Definition - Production - Diagnostic and therapeutic uses - Adjuvants	1	2
6	- **Mid-Term exam**	a1, b.2, b.1, b.2, c.1, d.1		1	2
7	- Hypersensitivity	a1, b.2, b.1,	- Type I hypersensitivity	1	

	reactions.	b.2, c.1, d.1	- Type II hypersensitivity - Type III hypersensitivity - Type IV hypersensitivity		2
8	- Tolerance and autoimmune diseases - Tumor immunology - Immunology of transplantation	a1, b.2, b.1, b.2, c.1, d.1	- Definition and types of tolerance - Induction of tolerance - Organ specific and systemic autoimmune diseases - Tumor immunology - Immunology of transplantation	2	4
9	- Vaccination	a1, b.2, b.1, b.2, c.1, d.1	- History of vaccination - Methods of acquiring immunity (natural and artificial) - Vaccine's types, mechanism of action, advantages and disadvantages of each type - Newly emergent vaccines (recombinant vaccines, DNA vaccines and mRNA vaccines)	3	6
10	- **Final Exam**	a1, b.2, b.1, b.2, c.1, d.1		1	2
Number of Weeks /and Units Per Semester				**15**	**30**

VI. Teaching strategies of the course:

Lectures
Discussion
Assignments
Videos
Problem-based learning and Case studies
Cooperative learning.
Field visit

VII. Assignments:

No	Assignments	Aligned CILOs (symbols)	Week Due	Mark
1	Activities and home works	a1, b.2, b.1, b.2, c.1, d.1	Continually	5
2	Field visit reports	a1, b2, c.1, d1	5th and 10th	5

VIII. Schedule of Assessment Tasks for Students during the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Activities and homework	Continually	5	5%	a1, b.2, b.1, b.2, c.1, d.1
2	Field visit reports	5th and 10th	5	5%	a1,b2, c.1, d1
3	Mid-term Exam	7th	20	20%	a1, b.2, b.1, b.2, c.1, d.1
4	Final Exam	15th	70	70%	a1, b.2, b.1, b.2, c.1, d.1
5	Total		100	100%	

IX. Learning Resources:

1- Required Textbook(s) (maximum two).

1- Immunology: a short course. Richard Coico. 7 th edt.2015. John Wiley. USA.
2- Kuby Immunology. Thomas Kindt. 7th edition 2013. W. H. Freeman & Company.

2- Essential References.

1- Roitt's essential Immunology. Peter Delves. 12th edition 2011. Wiley-Blackwell.
2- Stit's medicinal immunology 9th edition,

3- Electronic Materials and Web Sites *etc*.

- Cellular and Molecular Immunology: with STUDENT CONSULT Online A

X. Course Policies:

1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects**:

	- Assignments and projects will be assessed individually unless the teacher request for group work
5	**Cheating:** - Cheating by any means will cause the student failure and he/she must re-study the course
6	**Plagiarism:** Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the faculty rules.
7	**Other policies**: -

Template for Course Plan (Syllabus) of Immunology

I. - Information about Faculty Member Responsible for the Course:

		Office Hours					
Name of Faculty Member							
Location& Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Identification and General Information:

1	Course Title:	Immunology				
2	Course Number & Code:	PHA345				
3	Credit hours:	C.H				Total
		Th.	Seminar	Pr.	F. Tr.	
		2				2
4	Study level/year at which this course is offered:	Third year, first semester				
5	Pre –requisite (if any):	Pharmaceutical Microbiology				
6	Co –requisite (if any):	None				
7	Program (s) in which the course is offered	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	Language of teaching the course:	English				
9	System of Study:	semester				
10	Mode of delivery:	Regular				
11	Location of teaching the course:	Faculty of medical and Health sciences, Al-Saeed University.				

III. Course Description:

This course will explore the main principles in immunology and vaccination. The first part of the course begins by covering the basic structures of the human immune system, and then move on to look at ways of interaction between immune cells to produce an immune response. The role of the immune system will be studied in the following cases: infectious diseases, cancer, allergy, transplantation, and vaccination. The second part begins with the principles of vaccination, and then the Types of vaccines and their mechanisms of action.

IV. Course Objectives:

- To introduce students to the basic concepts in immunology.
- To understand the mechanisms of action of innate and acquired immunity.
- To correlate between different immune cells and their role in the immune system.
- To explain vaccine's production types, effects, mechanisms of action and the newly emergent vaccines.

V. Intended learning outcomes (ILOs) of the course:

Brief summary of the knowledge or skill the course is intended to develop:

- Identify the components of innate and acquired (humeral, and cell mediated) immune responses and describe the role of immune cell in the immune response.
- Explain mechanisms of production, types and efficacy of antibodies and vaccines and their mechanisms of action.
- Evaluate the usefulness, and the efficacy of the different types of antibodies and vaccines.
- Use appropriate research methods to analyze the characteristics and functional features of the immune response ant it interaction with immune modulating drugs.
- Provide information to the patients about the mechanisms and avoidance of undesirable immune reactions to certain drugs.
- Interact with health authorities and with the community and use the immunological knowledge to predict consequences in immune disorders.

VI. Course Content:

- Distribution of Semester Weekly Plan of Course Topics/Items and Activities.

A – Theoretical Aspect:

Order	Topics List	Week Due	Contact Hours
1	- Immunology Introduction - Innate immune response	1st	2
2	- Immunogens and antigens - Primary and secondary lymphoid organs	2nd	2
3	- Cell mediated immunity	3rd & 4th	4

4	- Humoral immunity	5th & 6th	4
5	- Monoclonal antibodies - Adjuvants	7th	2
6	- **Mid-Term exam**	8th	2
7	- Hypersensitivity reactions.	9th	2
8	- Tolerance and autoimmune diseases - Tumor immunology - Immunology of transplantation	10th & 11th	4
9	- Vaccination	12th, 13th 14th	6
10	- **Final Exam**	15th	2
Number of Weeks /and Units Per Semester		**15**	**30**

VII. Teaching strategies of the course:

Lectures
Discussion
Assignments
Videos
Problem-based learning and Case studies
Cooperative learning.
Field visit

VIII. Assignments:

No	Assignments	Week Due	Mark
1	Activities and home works	Continually	5
2	Field visit reports	5th and 10th	5

IX. Schedule of Assessment Tasks for Students During the Semester:

Assessment	Type of Assessment Tasks	Week Due	Mark	Proportion of Final Assessment
1	Activities and homework	Continually	5	5%

2	Field visit reports	5th and 10th	5	5%
3	Mid-term Exam	7th	20	20%
4	Final Exam	15th	70	70%
5	Total		100	100%

X. Learning Resources:

- Written in the following order: (Author – Year of publication – Title – Edition – Place of publication – Publisher).

1- Required Textbook(s) (maximum two).

1- Immunology: a short course. Richard Coico. 7 th edt.2015. John Wiley. USA.
2- Kuby Immunology. Thomas Kindt. 7th edition 2013. W. H. Freeman & Company.

2- Essential References.

1- Roitt's essential Immunology. Peter Delves. 12th edition 2011. Wiley-Blackwell. USA
2- Stit's medicinal immunology 9th edition, 2012.

3- Electronic Materials and Web Sites *etc*.

- Cellular and Molecular Immunology: with STUDENT CONSULT Online Access.

XI. Course Policies:

1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam.
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** - Assignments and projects will be assessed individually unless the teacher request for group work.
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course.
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:**

Course Specification of Pharmaceutics (3)

I. Course Identification and General Information:

1	Course Title:	Pharmaceutics (3)				
2	Course Code & Number:	PHA354				
3	Credit hours:	C.H				TOTAL
		Th.	Seminar	practical	Training.	
		2		1		3
4	Study level/ semester at which this course is offered:	3rd year / 1st semester				
5	Pre –requisite (if any):	Pharmaceutics (2)				
6	Co –requisite (if any):	none				
7	Program (s) in which the course is offered:	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	Language of teaching the course:	English / Arabic				
9	Study System	Semester				
10	Mode of delivery:	Regular				
11	Location of teaching the course:	Al-Saeed University campus				
12	Prepared By:	Dr. Abdulkarim Kassem Alzomor				

II. Course Description:

In this course provides knowledge and skills in designing solid pharmaceutical dosage, including powders, granules, tablets and capsules, which are globally the most widely manufactured dosage forms. In addition, the course covers pharmaceutical sterile products. The course also includes practical part that will help students to apply their learned knowledge.

III. Course Objectives:

This course aims to:

1- Introduce students to solid dosage forms such as powder, granules, tablets and capsules.
2- Introduce students to sterile dosage forms such as parenteral and ophthalmic preparation.

IV. Course Intended learning outcomes (CILOs) of the course		WRITE Symbol and number PIL(
a.1	Explicit the general properties, the types and roles of excipients, advantages and disadvantages of pharmaceutical solid and sterile dosage forms**.**	**A2**
a.2	Describe the stages of designing pharmaceutical solid and sterile dosage forms.	**A2**
b.1	Classify pharmaceutical solid and sterile dosage forms .	**B2, B3**
b.2	Design pharmaceutical solid and sterile dosage forms.	**B2, B3, B4**
c.1	Handle efficiently and safely the chemical materials and tools used in the laboratory.	**C1**
c.2	Operate the instruments and prepare extemporaneous pharmaceutical solid and sterile dosage forms .	**C1, C4, C5**
d.1	Communicate effectively and behave in discipline with colleagues.	**D1**
d.2	Participate efficiently with colleagues in a team work	**D1**

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1 Explicit the general properties, the types and roles of excipients, advantages and disadvantages of pharmaceutical solid and sterile dosage forms	- Lectures and Groups discussion. - Presentations - Self - learning.	Quizzes, Written exam.
a2- Describe the stages of designing pharmaceutical solid and sterile dosage forms.		

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1. Classify pharmaceutical dosage forms and categorize solid and sterile dosage forms.	- Discussions and Training - Field visits - Problem solving - Practical classes	- Quizzes, Homework - Observation - Task's Evaluates
b2. Design solid and sterile pharmaceutical dosage forms.		

(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1. Handle efficiently and safely the chemical materials and tools used in the laboratory.	- Discussions and Training - Field visits - Problem solving - Practical classes	- Quizzes, Homework - Observation - Task's Evaluates
c2. Operate the instruments and prepare extemporaneous pharmaceutical solid and sterile dosage forms .		

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1. Communicate effectively and behave in discipline with colleagues.	- Group discussions - Cooperative learning. - Self – learning - Inductive and deductive	- Homework - Evaluates of Oral Presentation
d2. Participate efficiently with colleagues in a team work.		

V. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	contact hours
1	**Solid dosage forms: (1) Introduction & Powders**	a1, a2, b1, b2	**Introduction** □ classifications of dosage forms □ Advantages and disadvantages □ Formulation consideration **Powders** □ Definitions, advantages, disadvantages □ classification (coarse, fine, micro fine, etc; divided, bulk; compounded; medicated, cosmetic) □ Formulation considerations □Bulk powder, divided powder and Dusting powder: formulation, examples □ Powders problems & overcome □ Powders packaging □ Quality control evaluation	2	4

2	**Solid dosage forms: (2) Granules**	a1, a2, b1, b2,d2	Definition, advantages, disadvantages Method of preparation Formulation considerations **Effervescent granules** o Definition, composition o Method of preparation: dry (fusion) method, wet method o Determination of the required quantity of effervescent base in the formulation	1	2
3	**Solid dosage forms: (3) Tablets**	a1, a2, b1, b2, c1, d1	Advantages and disadvantages. Types and Ideal properties of tablets Tablet excipients Tableting methods Steps, advantages and disadvantages (Direct compression, Dry granulation, Wet granulation) Tablet press machines Problems encountered during tablet formulation. Tablet coating Sugar coating , Film coating, Enteric coating, extended release coating : advantages, disadvantages, coating materials, process of coatings Quality evaluation	5	10
4	**Mid-term Exam**			1	2
5	**Solid dosage forms: (4) Capsules**	a1, a2, b1, b2, c2,d1	**(i) Hard gelatin capsules** • Advantages and disadvantages • Composition of capsule shell • types of capsule fill • Selection of capsule size. • Excipients used in hard gelatin capsule formulation. • Capsule filling process. • Storage of hard gelatin capsules. **(ii) Soft gelatin capsules** • Advantage and disadvantages. • Capsule shell composition. • types of capsule fill • Shapes and sizes. • Soft gelatin capsule formulation. • capsule filling process • specific properties:O2 impermeability, water content	2	4

6	**Sterile pharmaceutical dosage forms** (Introduction)	a1, a2, b1, b2, d2	**Differences between sterile & non-sterile dosage forms :** • Definition : sterility, sterilization, preservation, pyrogenicity, pyrogen-free • Review of sterilization methods and preservation of dosage forms • Aseptic techniques • Sources of contamination and methods of prevention • Design of aseptic area , Laminar flow benches services and maintenance) • Isotonicity of sterile preparations and methods of adjustment	1	2
7	**Sterile pharmaceutical dosage forms** (Parenteral preparations)	a1, a2, b1, b2, d1	• Preformulation factors ○ Route of administration of injection ○ Water for injection ○ Non-aqueous vehicles • Formulation consideration ○ Formulation of Infusion fluids • Prefilling , filling and package (small and large sacle) ○ Quality evaluation	2	4
8	**Sterile pharmaceutical dosage forms** (Ophthalmic preparations)	a1, a2, b1, b2, d1	• Anatomical features of the eye • Types of ophthalmic preparations • Formulation considerations • Sterilization and preservation. • Package • Quality evaluation	1	2
9	FINAL - EXAM			1	2
Number of Weeks /and Units Per Semester				**16**	**32**

B - Practical Aspect:

Order	Tasks/ Experiments	Number of Weeks	contact hours	Aligned Couse Intended Learning Outcomes CILOs
1.	Preparation of Dusting powders	1	2	c1,c2, , d1, d2
2.	Preparation of Effervescent base granules	2	4	c1,c2, , d1, d2
3.	Preparation of tablets using wet granulation method : paracetamol tablets	1	2	c1,c2, , d1, d2
4.	Preparation of tablets using wet granulation method : mefenamic acid tablets	2	4	c1,c2, , d1, d2
5.	Preparation of tablets using direct compression method : aspirin tablets	1	2	c1,c2, , d1, d2
6.	film-coating of tablets mefenamic acid	1	2	c1,c2, , d1, d2
7.	Preparation of hard gelatin capsules (Manual): aspirin	1	2	c1,c2, , d1, d2
8.	Preparation of hard gelatin capsules (Manual): paracetamol	1	2	c1,c2, , d1, d2
9.	Preparation of I.V. admixtures : DNS + vitamin C + vitamin B complex	1	2	c1,c2, , d1, d2
10.	Preparation of parenteral solutions from parenteral powders : reconstitution of cefuroxime sodium vial	1	2	c1,c2, , d1, d2
11.	Preparation of sterile NaCl eye wash.	1	2	c1,c2, , d1, d2
12	Final exam	1	2	c1,c2d1, d2
	Number of Weeks /and Units Per Semester	**14**	**28**	

VI. Teaching strategies of the course:

- Lectures
- Groups discussion.
- Discussions and Training
- Practical presentations
- Field visits
- Problem solving
- Practical in Lab
- Cooperative learning.
- Simulation Group discussions
- Self – learning
- Inductive and deductive

VII. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Class attendance and participation	**a1, a2, b1, b2, c1, d1, d2**	weekly	5
2	Homework, presentation	**a1, a2, b1, b2, c1, d1.**	11	5

VIII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method		Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Assignments		1-14	10	**10%**	a1,b1,b2,c1, a2, d1,d2
2	Mid-semester exam of theoretical part (written exam		**8**	**10**	**10%**	a1,a2,b1,c1, d1,d2
3	Lab. Term works	Attitude and Report	1-12	10	**10%**	c1, c2,d1,d2
		Accomplishments				
4	Final exam (practical)		12	30	30%	c1, c2,d1,d2
5	Final exam of theoretical part (written exam)		16	40	40%	a1,a2,b1,b2,c1, d1,d2
Total				100	100%	

I. Learning Resources

1- Required Textbook(s) (maximum two).

1- Aulton M.E., Pharmaceutics: the science of dosage form design, 4th edition, 2010, Churchill Livingstone, UK
2- Ansel`s Pharmaceutical dosage forms and drug delivery system, 2011, Lippincott Williams and Wilkins, USA.

2- Essential References.

1- Williams and Wilkins (2005). Remington; the Science and Practice of Pharmacy (21st edition). Publisher: Lippincott.

2- Herbert A. Lieberman, Martin M. Reiger, GeilbertS.Banker Pharmaceutical Dosage Forms, Vol. 3 (Pharmaceutical Dosage Forms-Disperse), Third Edition, 2010.

3- Electronic Materials and Web Sites *etc*.

www.pubmed.com

	IX. Course Policies:
1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects**: - Assignments and projects will be assessed individually unless the teacher request for group work
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the faculty rules.
7	**Other policies**: -

Template for Course Plan (Syllabus) of Pharmaceutics (3)

I. - Information about Faculty Member Responsible for the Course:

		Office Hours					
Name of Faculty Member							
Location& Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Identification and General Information:

1	Course Title:	Pharmaceutics (3)				
2	Course Code & Number:	PHA354				
3	Credit hours:	C.H				TOTAL
		Th.	Seminar	practical	Training.	
		2		1		3
4	Study level/ semester at which this course is offered:	3rd year / 1st semester				
5	Pre –requisite (if any):	Pharmaceutics (2)				
6	Co –requisite (if any):	none				
7	Program (s) in which the course is offered:	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	Language of teaching the course:	English / Arabic				
9	Study System	Semester				
10	Mode of delivery:	Regular				
11	Location of teaching the course:	Al-Saeed University campus				

III. Course Description:

In this course provides knowledge and skills in designing solid pharmaceutical dosage, including powders, granules, tablets and capsules, which are globally the most widely manufactured dosage forms. In addition, the course covers pharmaceutical sterile products. The course also includes practical part that will help students to apply their learned knowledge.

IV. Course Objectives:

This course aims to:

1. Introduce students to solid dosage forms such as powder, granules, tablets and capsules.
2. Introduce students to sterile dosage forms such as parenteral and ophthalmic preparation.

V. Intended learning outcomes (ILOs) of the course:

1- Explicit the general properties, the types and roles of excipients, advantages and disadvantages of pharmaceutical solid and sterile dosage forms.
2- Describe the stages of designing pharmaceutical solid and sterile dosage forms.
3- Classify pharmaceutical solid and sterile dosage forms.
4- Design pharmaceutical solid and sterile dosage forms.
5- Handle efficiently and safely the chemical materials and tools used in the laboratory.
6- Operate the instruments and prepare extemporaneous pharmaceutical solid and sterile dosage forms
7- Communicate effectively and behave in discipline with colleagues.
8- Participate efficiently with colleagues in a team work

VI. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Sub Topics List	Week Due	contact hours
1	**Solid dosage forms: (1) Introduction & Powders**	**Introduction** classifications of dosage forms Advantages and disadvantages Formulation consideration **Powders** Definitions, advantages, disadvantages classification (coarse, fine, micro fine, etc; divided, bulk; compounded; medicated, cosmetic) Formulation considerations Bulk powder, divided powder and Dusting powder: formulation, examples Powders problems & overcome Powders packaging Quality control evaluation	W1 & W2	4

2	**Solid dosage forms: (2) Granules**	□ Definition, advantages, disadvantages □ Method of preparation □ Formulation considerations **Effervescent granules** o Definition, composition o Method of preparation: dry (fusion) method, wet method o Determination of the required quantity of effervescent base in the formulation	W3	2
3	**Solid dosage forms: (3) Tablets**	□ Advantages and disadvantages. □ Types and Ideal properties of tablets □ Tablet excipients	W4 & W5	10
		□ Tableting methods Steps, advantages and disadvantages (Direct compression, Dry granulation, Wet granulation)	W6	
		□ Tablet press machines □ Problems encountered during tablet formulation.	W7	
		□ Tablet coating Sugar coating , Film coating, Enteric coating, extended release coating : advantages, disadvantages, coating materials, process of coatings □ Quality evaluation	W8	
4	**Mid-term Exam**		W9	2
5	**Solid dosage forms: (4) Capsules**	**(i) Hard gelatin capsules** • Advantages and disadvantages • Composition of capsule shell • types of capsule fill • Selection of capsule size. • Excipients used in hard gelatin capsule formulation. • Capsule filling process. • Storage of hard gelatin capsules. **(ii) Soft gelatin capsules** • Advantage and disadvantages. • Capsule shell composition. • types of capsule fill • Shapes and sizes. • Soft gelatin capsule formulation. • capsule filling process	W10 & W11	4

		• specific properties:O2 impermeability, water content		
6	**Sterile pharmaceutical dosage forms** (Introduction)	**Differences between sterile & non-sterile dosage forms :** • Definition : sterility, sterilization, preservation, pyrogenicity, pyrogen-free • Review of sterilization methods and preservation of dosage forms • Aseptic techniques • Sources of contamination and methods of prevention • Design of aseptic area , Laminar flow benches services and maintenance) • Isotonicity of sterile preparations and methods of adjustment	W12	2
7	**Sterile pharmaceutical dosage forms** (Parenteral preparations)	• Preformulation factors o Route of administration of injection o Water for injection o Non-aqueous vehicles • Formulation consideration o Formulation of Infusion fluids • Prefilling , filling and package (small and large sacle) o Quality evaluation	W13 & W14	4
8	**Sterile pharmaceutical dosage forms** (Ophthalmic preparations)	• Anatomical features of the eye • Types of ophthalmic preparations • Formulation considerations • Sterilization and preservation. • Package • Quality evaluation	W15	2
9		FINAL - EXAM	W16	2
Number of Weeks /and Units Per Semester			**16**	**32**

B - Practical Aspect:

Order	Tasks/ Experiments	Number of Weeks	contact hours
1.	Preparation of Dusting powders	W1	2
2.	Preparation of Effervescent base granules	W2, W3	4
3.	Preparation of tablets using wet granulation method : paracetamol tablets	W4	2
4.	Preparation of tablets using wet granulation method : mefenamic acid tablets	W5, W6	4
5.	Preparation of tablets using direct compression method : aspirin tablets	W7	2
6.	film-coating of tablets mefenamic acid	W8	2
7.	Preparation of hard gelatin capsules (Manual): aspirin	W9	2
8.	Preparation of hard gelatin capsules (Manual): paracetamol	W10	2
9.	Preparation of I.V. admixtures : DNS + vitamin C + vitamin B complex	W11	2
10.	Preparation of parenteral solutions from parenteral powders : reconstitution of cefuroxime sodium vial	W12	2
11.	Preparation of sterile NaCl eye wash.	W13	2
12.	Final exam	W14	2
Number of Weeks /and Units Per Semester		14	28

VII. Teaching strategies of the course:

- Lectures
- Groups discussion.
- Discussions and Training
- Practical presentations
- Field visits
- Problem solving
- Practical in Lab
- Cooperative learning.
- Simulation Group discussions
- Self – learning
- Inductive and deductive

VIII. Assignments:

No	Assignments	Week Due	Mark
1	Class attendance and participation	weekly	5
2	Homework, presentation	11	5

IX. Shedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method		Week Due	Mark	Proportion of Final Assessment
1	Assignments		1-14	10	**10%**
2	Mid-semester exam of theoretical part (ritten exam)		**9**	**10**	**10%**
3	Lab. Term works	Attitude & Report	1-12	10	**10%**
		Accomplishments			
4	Final exam (practical)		12	30	30%
5	Final exam of theoretical part (written exam)		16	40	40%
Total				100	100%

X. Learning Resources

1- Required Textbook(s) (maximum two).

1. Aulton M.E., Pharmaceutics: the science of dosage form design, 4th edition, 2010, Churchill Livingstone, UK
2. Ansel`s Pharmaceutical dosage forms and drug delivery system, 2011, Lippincott Williams and Wilkins, USA.

2- Essential References.

1. Williams and Wilkins (2005). Remington; the Science and Practice of Pharmacy (2first edition). Publisher: Lippincott.
2. Herbert A. Lieberman, Martin M. Reiger, GeilbertS.Banker Pharmaceutical Dosage Forms, Vol. 3 (Pharmaceutical Dosage Forms-Disperse), Third Edition, 2010.

3- Electronic Materials and Web Sites *etc*.

www.pubmed.com

XI. Course Policies:

1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam.

2	**Tardy:** **-** any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** **-** any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** - Assignments and projects will be assessed individually unless the teacher request for group work.
5	**Cheating**: **-** Cheating by any means will cause the student failure and he/she must re-study the course.
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:**

Course Specification of Pharmacology (1)

I. Course Identification and General Information:

1	**Course Title:**	Pharmacology (1)				
2	**Course Code & Number:**	**PHA361**				
3	**Credit hours:**	C.H				TOTAL
		Th.	Seminar	practical	Training.	
		2		**1**		**3**
4	**Study level/ semester at which this course is offered:**	Third level, first semester				
5	**Pre –requisite (if any):**	Physiology (2)				
6	**Co –requisite (if any):**	Pathophysiology				
7	**Program (s) in which the course is offered:**	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	**Language of teaching the course:**	English Language				
9	**Study System**	Semester				
10	**Mode of delivery:**	Regular				
11	**Location of teaching the course:**	University				
12	**Prepared By:**	**Dr. Hamad Mahmood Alshabi**				

II. Course Description:

This course provides student with basic principle of pharmacology. It covers introduction to pharmacology; principle of pharmacodynamics and pharmacokinetics; types of drug-receptor interactions; pharmacology of autacoids and their antagonists, anti-inflammatory drugs and drugs affecting the autonomic nervous system and skeletal muscles. This course also involves some pharmacological experiments.

III. Course Objectives:

This course intends to:

1- Provide students with solid foundation in pharmacology to enable them to understand the basic pharmacodynamic and pharmacokinetic principles of drug action.

2- Provide students with comprehensive coverage of drug classes: autacoids and their antagonists, anti-inflammatory drugs and drugs affecting the autonomic nervous system and skeletal muscles.

3- Prepare students to the following courses of pharmacology.

IV. Course Intended learning outcomes (CILOs) of the course: Upon successful completion of this course, the student should be able to:		WRITE Symbol and number of PILOs
a.1	Identify the basic principles of pharmacology; drug development, nomenclature, pharmacokinetics and pharmacodynamics.	**A2, A3**
a.2	Describe the functions of the autonomic nervous system, pharmacology of drugs affecting its functions and also pharmacology of autacoids and their antagonists, anti inflammatory drugs and drugs acting on skeletal muscles.	**A1, A3**
b.1	Differentiate between the major drug classes and between members of each drug class in relation to their mechanism of action, pharmacokinetic parameters and adverse effects.	**B1**
b.2	Select optimum therapeutic agents based on their binding sites, molecular mechanism of action and pharmacokinetic parameters.	**B3**
c.1	Apply the principles of experimental pharmacology to investigate drug actions of different pharmacological classes.	**C1**
c.2	Advise patients and other health professionals on proper use of medicines and their possible adverse effects.	**C2, C4**
d.1	Demonstrate critical thinking, decision making, team working and communication skills.	**D1**
d.2	Utilize different resources of pharmacology (books, professional sites and scientific journals) to get information about the drugs.	**D3**

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	**Teaching strategies**	**Assessment Strategies**
a1- Identify the basic principles of pharmacology; drug development, nomenclature, pharmacokinetics and pharmacodynamics.	- Interactive lectures - Groups discussion. - Case-Study - Assignments	- Written Exams (midterm and final) - Quizzes - Multiple Choice Questions (MCQs) - Assignments **&** Coursework

a2- Describe the functions of the autonomic nervous system, pharmacology of drugs affecting its functions and also pharmacology of autacoids and their antagonists, anti-inflammatory drugs and drugs acting on skeletal muscles.		Activities

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	**Teaching strategies**	**Assessment Strategies**
b1- Differentiate between the major drug classes and between members of each drug class in relation to their mechanism of action, pharmacokinetic parameters and adverse effects.	- Interactive lectures - Groups discussion. - Problem-solving learning. - Assignments - Simulation	- Written Exams (midterm and final) - Quizzes - Multiple Choice Questions (MCQs) - Assignments & Coursework Activities - Problem-solving exercises.
b2- Select optimum therapeutic agents based on their binding sites, molecular mechanism of action and pharmacokinetic parameters.		

(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	**Teaching strategies**	**Assessment Strategies**
c1- Apply the principles of experimental pharmacology to investigate drug actions of different pharmacological classes.	- Practical classes - Simulated software programs. - Problem-solving learning. - Case-Study	- Practical Lab Assessments and reports - Problem-solving exercises. - Coursework Activities
c2- Advise patients and other health professionals on proper use of medicines and their possible adverse effects.		

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	**Teaching strategies**	**Assessment Strategies**
d1- Demonstrate critical thinking, decision making, team working and communication skills.	- Practical classes. - Cooperative & Self – learning. - Problem-solving learning. - Assignments	- Oral Presentation - Assignments & Coursework Activities - Reports of Assignments - Problem Solving Exercise
d2- Utilize different resources of pharmacology (books, professional sites and scientific journals) to get information about the drugs.		

V. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	contact hours
1	General Principles Of Pharmacology	a1, b1, d2	- Terminology and general introduction. - Routes of drug administration, advantages and disadvantages. - Pharmacokinetics: passage of drug across the biological membranes. Absorption, distribution, metabolism and elimination of drugs and factors affecting them. Various pharmacokinetic parameters - Pharmacodynamics: drug receptors, mechanisms of drug action, signaling pathways and drug action. - Adverse drug reactions and Drug interactions.	5	10
2	Introduction To Autonomic Nervous System (Ans)	a2, d2	- Organization of ANS, its subdivisions and innervations, Neurotransmitters in ANS, their synthesis, release and fate. Autonomic Receptors,	1	2

			ANS effects and regulation.		
3		a1, a2	**Mid-term Exam**	**1**	**2**
4	Drugs Acting On Autonomic Nervous System (Ans) And Skeletal Muscles:	a2, b1, b2, c2, d2	- Cholinoceptor-Activating & Cholinesterase-Inhibiting Drugs. - Cholinoceptor-Blocking Drugs: Muscarinic receptors blocking drugs, Ganglionic blocking drugs and Neuromuscular blockers. -Adrenoceptor Agonists and Sympathomimetic Drugs. - Adrenoceptor Antagonist Drugs.	**4**	**8**
5	Autacoids And Their Antagonists	a2, b1, b2, c2, d2	-Histamine and anti-histamines, serotonin and serotonin antagonist, -Prostaglandins, Thromboxanes, Leukotrienes, Kinins and other peptides.	**2**	**4**
6	Pharmacology Of Anti-Inflammatory Drugs	a2, b1, b2, c2, d2	Classification, mechanism of action, indications, adverse effects of anti-inflammatory drugs.	**2**	**4**
7		a1, a2, b1, b2, c2 d2	**Final Term exam**	**1**	**2**
Number of Weeks /and Units Per Semester				**16**	**32**

B - Practical Aspect:

Order	Tasks/ Experiments	Number of Weeks	contact hours	Learning Outcomes
1	Study of the common laboratory animals used in experimental pharmacology and their handling.	**1**	**2**	c1, d1-d3
2	Study of the dosage forms and the routes of administration of drugs in mice/rats.	**1**	**2**	a1, b1, c1, c2, d1, d2
3	To study the effects of cholinergic agents on Rabbit's Eyes.	**1**	**2**	a2, b1, c1, c2, d1, d2
4	To study the effects of anticholinergic agents on Rabbit's Eyes.	**1**	**2**	a2, b1, c1, c2, d1, d2

5	To identify the unknown drug & differentiate its effects on Rabbit's Eyes.	**2**	**4**	a2, b1, c1, c2, d1, d2
6	To demonstrate the effects of stimulant drugs on isolated Rabbit's intestine.	**1**	**2**	a2, b1, c1, c2, d1, d2
7	To demonstrate the effects of depressant drugs on isolated Rabbit's intestine.	**1**	**2**	a2, b1, c1, c2, d1, d2
8	To differentiate the effects of an unknown drug on isolated Rabbit's intestine and identify the (unknown) drug.	**1**	**2**	a2, b1, c1, c2, d1, d2
9	Record the Dose – Response Curve of acetylcholine on isolated rabbit ileum.	**1**	**2**	a2, b1, c1, c2, d1, d2
10	To study the Analgesic activity of some drugs on tail flick apparatus in rats.	**1**	**2**	a2, b1, c1, c2, d1, d2
11	Evaluation of the analgesic effects of drugs using the Hot-plate method in mice	**1**	**2**	a2, b1, c1, c2, d1, d2
12	To study the anti-inflammatory activity of ibuprofen in rats.	**1**	**2**	a2, b1, c1, c2, d1, d2
13	**Final Practical Exam**	**1**	**2**	a2, b1, c1, c2, d1
Number of Weeks /and Units Per Semester		**14**	**28**	

VI. Teaching strategies of the course:

- Interactive lectures
- Groups discussion.
- Case-Study
- Assignments
- Problem-solving learning.
- Simulation
- Practical classes
- Simulated software programs.
- Cooperative & Self – learning.

VII. Assignments:

No	Assignments	Aligned CILOs (symbols)	Week Due	Mark
1	Participation, Homework Assignments	**a1, a2, b1, b2, c1, c2, d1, d2**	Weekly	3
2	Exercises, Reports	**b1, b2, c1, c2, d1, d2**	Weekly	3
3		**Total**		6

VIII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Assignments	**1-14**	**6**	**6%**	**a1, a2, b1, b2, c1, c2, d1, d2**
2	Quizzes 1	6	2	2%	a1, a2
3	Mid-term exam of theoretical part (written exam)	7	**10**	**10%**	a1, a2
4	Quizzes 2	12	2	2%	a1, a2, b1, b2
5	Practical lab work	1-13	10	10%	a2, b1, c1, c2, d1, d2
6	Final exam (practical)	14	30	30%	c a2, b1, c1, c2, d1
7	Final exam of theoretical part (written exam)	16	40	40%	a1, a2, b1, b2, c2, d2
	Total		100	100%	

IX. Learning Resources:

1- Required Textbook(s) (maximum two).

1- Katzung, B.G., (2018). Basic & Clinical Pharmacology, 14th edition, the Mc Grow Hill Companies.
2- Lippincott's illustrated reviews, 2019, Pharmacology, 7th edition, Wolters Kluwer.

2- Essential References.

1- James M. Ritter, Rod J. Flower, 2020, Rang and Dale Pharmacology. 9th edition, Churchill Livingstone Elsevier.
2- Laurence L. Brunton, 2018. Goodman and Gillman's Pharmacological Basis of Therapeutics: 13th edition, McGraw-Hill Education.

3- Electronic Materials and Web Sites *etc.*

1- Website: Pharmacology Animation Book, http://animationbook.net
2- www.pharmacology2000.com/learning2.htm
3- www.pharmacology.com

X. Course Policies:

1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam

2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects**: - Assignments and projects will be assessed individually unless the teacher request for group work
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the faculty rules.
7	**Other policies**: -

Template for Course Plan (Syllabus) of Pharmacology (1)

I. - Information about Faculty Member Responsible for the Course:

		Office Hours					
Name of Faculty Member							
Location& Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Identification and General Information:

1	Course Title:	Pharmacology (1)					
2	Course Number & Code:	**PHA361**					
3	Credit hours:	C.H					Total
		Th.	Seminar	Pr.	F. Tr.		
		2		1			3
4	Study level/year at which this course is offered:	Third level, first semester					
5	Pre –requisite (if any):	Physiology (2)					
6	Co –requisite (if any):	Pathophysiology					
7	Program (s) in which the course is offered	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)					
8	Language of teaching the course:	English Language					
9	System of Study:	Semester					
10	Mode of delivery:	Regular					
11	Location of teaching the course:	University					

III. Course Description:

This course provides student with basic principle of pharmacology. It covers introduction to pharmacology; principle of pharmacodynamics and pharmacokinetics; types of drug-receptor interactions; pharmacology of autacoids and their antagonists, anti-inflammatory drugs and drugs affecting the autonomic nervous system and skeletal muscles. This course also involves some pharmacological experiments.

IV. Course Objectives:

This course intends to:

1- Provide students with solid foundation in pharmacology to enable them to understand the basic pharmacodynamic and pharmacokinetic principles of drug action.

2- Provide students with comprehensive coverage of drug classes: autacoids and their antagonists, anti-inflammatory drugs and drugs affecting the autonomic nervous system and skeletal muscles.

3- Prepare students to the following courses of pharmacology.

V. Intended learning outcomes (ILOs) of the course:

Upon successful completion of this course, the student should be able to:

1- Identify the basic principles of pharmacology; drug development, nomenclature, pharmacokinetics and pharmacodynamics.
2- Describe the functions of the autonomic nervous system, pharmacology of drugs affecting its functions and also pharmacology of autacoids and their antagonists, anti-inflammatory drugs and drugs acting on skeletal muscles.
3- Differentiate between the major drug classes and between members of each drug class in relation to their mechanism of action, pharmacokinetic parameters and adverse effects.
4- Select optimum therapeutic agents based on their binding sites, molecular mechanism of action and pharmacokinetic parameters.
5- Apply the principles of experimental pharmacology to investigate drug actions of different pharmacological classes.
6- Advise patients and other health professionals on proper use of medicines and their possible adverse effects.
7- Demonstrate critical thinking, decision making, team working and communication skills.
8- Utilize different resources of pharmacology (books, professional sites and scientific journals) to get information about the drugs.

VI. Course Content:

A – Theoretical Aspect:

Order	Topics List	Week Due	Contact Hours
1	**GENERAL PRINCIPLES OF PHARMACOLOGY:** - Terminology and general introduction. - Routes of drug administration, advantages and disadvantages. - Pharmacokinetics: passage of drug across the biological membranes. Absorption, distribution, metabolism and elimination of drugs and factors affecting them. Various pharmacokinetic parameters - Pharmacodynamics: drug receptors, mechanisms of drug	1, 2, 3, 4, 5	10

	action, signaling pathways and drug action. - Adverse drug reactions and Drug interactions.		
2	**Introduction to Autonomic nervous system (ANS)** - Organization of ANS, its subdivisions and innervations, Neurotransmitters in ANS, their synthesis, release and fate. Autonomic Receptors, ANS effects and regulation.	6	2
3	**Mid-term Exam**	7	2
4	**DRUGS ACTING ON AUTONOMIC NERVOUS SYSTEM (ANS) AND SKELETAL MUSCLES:** - Cholinoceptor-Activating & Cholinesterase-Inhibiting Drugs. - Cholinoceptor-Blocking Drugs: Muscarinic receptors blocking drugs, Ganglionic blocking drugs and Neuromuscular blockers. -Adrenoceptor Agonists and Sympathomimetic Drugs. - Adrenoceptor Antagonist Drugs.	8, 9, 10, 11	8
5	**AUTACOIDS AND THEIR ANTAGONISTS:** -Histamine and anti-histamines, serotonin and serotonin antagonist, - Prostaglandins, Thromboxanes, Leukotrienes, Kinins and other peptides.	12, 13	4
6	**PHARMACOLOGY OF ANTI-INFLAMMATORY DRUGS** Classification, mechanism of action, indications, adverse effects of anti-inflammatory drugs.	14, 15	4
7	**Final Term exam**	16	2
Number of Weeks /and Units Per Semester		**16**	**32**

B – Practical Aspect:

Order	Topics List	Week Due	Contact Hours
1	Study of the common laboratory animals used in experimental pharmacology and their handling.	1	**2**
2	Study of the dosage forms and the routes of administration of drugs in mice/rats.	2	**2**
3	To study the effects of cholinergic agents on Rabbit's Eyes.	3	**2**
4	To study the effects of anticholinergic agents on Rabbit's Eyes,	4	**2**
5	To identify the unknown drug & differentiate its effects on .Rabbit's Eyes	5, 6	**4**

6	To demonstrate the effects of stimulant drugs on isolated Rabbit's intestine.	7	**2**
7	To demonstrate the effects of depressant drugs on isolated Rabbit's intestine.	8	**2**
8	To differentiate the effects of an unknown drug on isolated Rabbit's intestine and identify the (unknown) drug.	9	**2**
9	Record the Dose – Response Curve of acetylcholine on isolated rabbit ileum.	10	**2**
10	To study the Analgesic activity of some drugs on tail flick apparatus in rats.	11	**2**
11	Evaluation of the analgesic effects of drugs using the Hot-plate method in mice	12	**2**
12	To study the anti-inflammatory activity of ibuprofen in rats.	13	**2**
13	**Final Practical Exam**	14	2
Number of Weeks /and Units Per Semester		**14**	**28**

VII. Teaching strategies of the course:

- Interactive lectures
- Groups discussion.
- Case-Study
- Assignments
- Problem-solving learning.
- Simulation
- Practical classes
- Simulated software programs.
- Cooperative & Self – learning.

VIII. Assignments:

No	Assignments	Week Due	Mark
1	Participation, Homework Assignments	Weekly	3
2	Exercises, Reports	Weekly	3
3	**Total**		6

IX. Schedule of Assessment Tasks for Students During the Semester:

Assessment	Type of Assessment Tasks	Week Due	Mark	Proportion of Final Assessment
1	Assignments	**1-14**	**6**	**6%**
2	Quizzes 1	6	2	2%
3	Mid-term exam of theoretical part (written exam)	7	**10**	**10%**
4	Quizzes 2	12	2	2%
5	Practical lab work	1-13	10	10%
6	Final exam (practical)	14	30	30%
7	Final exam of theoretical part (written exam)	16	40	40%
8	**Total**		100	100%

X. Learning Resources:

1- Required Textbook(s) (maximum two).

1- Katzung, B.G., (2018). Basic & Clinical Pharmacology, 14th edition, the Mc Grow Hill Companies.
2- Lippincott's illustrated reviews, 2019, Pharmacology, 7th edition, Wolters Kluwer.

2- Essential References.

1- James M. Ritter , Rod J. Flower, 2020, Rang and Dale Pharmacology. 9th edition, Churchill Livingstone Elsevier.
2- Laurence L. Brunton, 2018. Goodman and Gillman's Pharmacological Basis of Therapeutics 13th edition, McGraw-Hill Education.

3- Electronic Materials and Web Sites *etc.*

1- Website: Pharmacology Animation Book, http://animationbook.net
2- www.pharmacology2000.com/learning2.htm
3- www.pharmacology.com

XI. Course Policies:

1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2	**Tardy:**

	- any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** - Assignments and projects will be assessed individually unless the teacher request for group work
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:** -

Course Specification of Phytochemistry (1)

I. Course Identification and General Information:

1	**Course Title:**	Phytochemistry (1)				
2	**Course Code & Number:**	**PHA374**				
3	**Credit hours:**	C.H				TOTAL
		Th.	Seminar	practical	Training.	
		2		1		3
4	**Study level/ semester at which this course is offered:**	Third Level, First semester				
5	**Pre –requisite (if any):**	Pharmacognosy (2)				
6	**Co –requisite (if any):**	None				
7	**Program (s) in which the course is offered:**	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	**Language of teaching the course:**	English				
9	**Study System**	Semester				
10	**Mode of delivery:**	Regular				
11	**Location of teaching the course:**	University campus				
12	**Prepared By:**	**Dr. Abdulrahman Roshan**				

I. Course Description:

This course focuses on the study of active ingredients of crude drugs based on chemical classification (carbohydrates, glycosides, tannins, bitter principles and natural toxins). The study includes methods of isolation, identification, qualitative and quantitative evaluation, medicinal uses, physical and chemical properties, biosynthetic pathway and chemical structure activity relationship. This course also includes practical part.

II. Course Objectives:

At the end of the course, the student will be able to

1- Gain valuable knowledge about the chemistry and biological sources of carbohydrates, glycosides, tannins and natural toxins

2- Master the different methods of isolation and characterization of naturally occurring compounds as carbohydrates, glycosides, tannins, bitter principles and natural toxins as well as their pharmacological potential.

3- Draw and discuss the biosynthetic pathways of the studded compounds.

4- Gain understanding of qualitative and quantitative estimation methods of carbohydrates, glycosides and tannins.

III. Course Intended learning outcomes (CILOs) of the course		WRITE Symbol and number of PILOs
a.1	Demonstrate the essential knowledge of extraction, isolation, purification, characterization, qualitative and quantitative determination of carbohydrates, glycosides, tannins, bitter principles and natural toxins as well as their pharmacological effects.	**A2, A3**
a.2	Recognize the biosynthetic pathway and draw the chemical structure of such biologically active compounds.	**A2, A3**
b.1	Design appropriate methods for isolation, purification, qualitative and quantitative determination of carbohydrates, glycosides, tannins and bitter principles as natural constituents.	**B2, B4**
b.2	Anticipate the physical, chemical and pharmacological properties of carbohydrates, glycosides, tannins, bitter principles and natural toxins.	**B1**
c.1	Use the chemical and physical methods for carbohydrates, glycosides and tannins extraction, isolation and purification from their natural origin.	**C1, C5**
c.2	Conduct the appropriate method for the carbohydrates, glycosides and tannins qualitative and quantitative determination according to GLP guidelines.	**C1, C5**
d.1	Demonstrate time management, independent and team working, decision making and life-long learning skills.	**D1, D2**
d.2	Carry out private study, including direct study on specific topics, independent study from textbooks.	**D3**

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1. Demonstrate the essential knowledge of extraction, isolation, purification, characterization, qualitative and quantitative determination of carbohydrates, glycosides, tannins, bitter principles and natural toxins as well as their pharmacological effects.	Lecture and group discussion	Participation, quizzes and written exam
a2. Recognize the biosynthetic pathway and draw the chemical structure of such biologically active compounds.		

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1. Design appropriate methods for isolation, purification, qualitative and quantitative determination of carbohydrates, glycosides, tannins and bitter principles as natural constituents.	Lecture, discussion and problem based learning, practical (lab) classes	Oral presentation, written and practical examination
b2. Anticipate the physical, chemical and pharmacological properties of carbohydrates, glycosides, tannins, bitter principles and natural toxins.		

(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1. Use the chemical and physical methods for carbohydrates, glycosides and tannins extraction, isolation and purification from their natural origin.	Laboratory work	Practical works, Practical reports and presentations based on their experimental work
c2. Conduct the appropriate method for the carbohydrates, glycosides and tannins qualitative and quantitative determination according to GLP guidelines.		

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1. Demonstrate time management, independent and team working, decision making and life-long learning skills.	Practical class, assignment and discussion in groups Problem-based Learning	- Reports, presentations, - Problem Solving Exercise
d2. Carry out private study, including direct study on specific topics, independent study from textbooks.		

IV. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	contact hours
1	Carbohydrates (monosaccharides and disaccharides)	a1-a2, b2, c1, d1, d2	-Introduction to carbohydrates Classification, separation, purification, qualitative and quantitative evaluation and medicinal uses of: monosaccharides -Classification, separation, purification, qualitative and quantitative evaluation and medicinal uses of: disaccharides	3	6
2	Carbohydrates (Polysaccharides)	a1-a2, b2, c1, d1, d2	-Separation, purification, qualitative identification and medicinal uses of homo-polysaccharides, hetero polysaccharides and polysaccharide containing amino-sugar units	2	4
3	Glycosides	a1-a2, b2, c1, d1, d2	-Introduction to glycosides	1	2
4	Mid-term Exam	a1-a2, b2, c1		1	2
2	Glycosides	a1-a2, b2, c1, d1, d2	-Simple Phenolic glycosides: separation, purification, identification, quantitative and quantitative evaluation and their medicinal uses. -Anthracene glycosides: separation, purification, identification, quantitative and quantitative evaluation and their medicinal uses. -Flavonoid glycosides: separation, purification, identification, quantitative and quantitative evaluation and their medicinal uses. -Cardiac glycosides: separation, purification, identification, quantitative and quantitative evaluation and their medicinal uses.	5	10

			-Terpenoid glycosides: separation, purification, identification, quantitative and quantitative evaluation and their medicinal uses.		
3	Tannins	a1-a2, b2, c1, d1, d2	-Introduction, classification and study of different classes and biological activities	1	2
4	Bitter principles	a1-a2, b2, c1, d1, d2	-Introduction, classification and study of different classes and biological activities	1	2
5	Natural toxins	a1-a2, b2, c1, d1, d2	-Introduction, study of different classes and biological activities	1	2
	Final Term exam	a1-a2, b2, c1		1	2
Number of Weeks /and Units Per Semester				**16**	**32**

B - Practical Aspect:

Order	Tasks/ Experiments	Number of Weeks	contact hours	Learning Outcomes
1	Qualitative identification of carbohydrates (Monosaccharide, Disaccharides)	**1**	**2**	**b1, c2, d1,d2**
2	Qualitative identification of carbohydrates (Polysaccharides)	**1**	**2**	**b1, c2, d1,d2**
3	General scheme for analysis of carbohydrate, and unknowns	**1**	**2**	**b1, c1, c2, d1,d2**
4	Carbohydrate Assay; Quantitative estimation of Sugars Assay of glucose (Copper reduction and enzymatic methods)	**1**	**2**	**b1, c1, c2, d1,d2**
5	Carbohydrate Assay; Quantitative estimation of Sugars Assay of glucose and fructose mixture (Copper reduction and iodimertric method)	**1**	**2**	**b1, c1, c2, d1,d2**
6	Carbohydrate Assay; Quantitative estimation of Sugars Assay of glucose and Sucrose	**1**	**2**	**b1, c1, c2, d1,d2**

	mixture (Direct copper reduction and copper reduction method after hydrolysis) Assay of glucose and maltose mixture			
7	Qualitative identification of glycosides: (Anthraquinones, cyanogen and Flavonoids)	**1**	**2**	**b1, c1, c2, d1,d2**
8	Qualitative identification of cardiac glycosides	**1**	**2**	**b1, c1, c2, d1,d2**
9	Qualitative identification of tannins and bitter principles	**1**	**2**	**b1, c1, c2, d1,d2**
10	Preliminary phytochemical screening of unknown drugs	**1**	**2**	**b1, c1, c2, d1,d2**
11	Quantitative estimation of glycosides (Colorimetric estimation of digitalis glycosides by Baljet's reagent)	**1**	**2**	**b1, c1, c2, d1,d2**
12	Presentation of the assignment.	**1**	**2**	**a1, a2, b1, d1, d2**
13	Revision	**1**	**2**	**b1, c1, c2, d1,d2**
14	Practical exam	**1**	**2**	**b1, c1, c2**
Number of Weeks /and Units Per Semester		**14**	**28**	

V. Teaching strategies of the course:

Lecture and group discussion
Problem based learning,
Practical (lab) classes, Laboratory work
Assignment
Problem-based Learning

VI. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	lab report	**b1, c1, c2, d1,d2**	1-6, 8-12	10%
2	Research assignment	**a1, a2, b1, d1, d2**	13	5%

VII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Attendance/quiz	All	5	5%	
2	Lab reports	1-6, 8-12	10	%10	**b1, c1, c2, d1,d2**
3	Med- Term Exam	7	10	10%	**a1-a2, b2, c1**
4	Research assignment	12	5	5%	**a1, a2, b1, d1, d2**
5	Practical exam	14	30	30%	**b1, c1, c2**
6	Final written exam	16	40	40%	**a1-a2, b2, c1**
7			100	100%	

VIII. Learning Resources:

1- Required Textbook(s) (maximum two).

1- Evans, William Charles, Evans, Daphne, & Trease, George Edward. (2009). Trease and Evans pharmacognosy (16th ed. / rev. with the assistance of Daphne Evans.). Saunders/Elsev
2- Shah Biren N., Seth A.K. (2010). Textbook of Pharmacognosy and Phytochemistry, Firs Edition, Elsevier,

2- Essential References.

1- Dewick P. M. (2009)"Medicinal Natural Products, a Biosynthetic Approach", 3rd edition. John Wiley & sons.
2- Harborne J. B. (1984) Phytochemical Methods A GUIDE TO MODERN TECHNIQUES PLANT ANALYSIS. (2nd edition). New York. Chapman and Hall.

3- Electronic Materials and Web Sites *etc.*

1- 1- Dr. Duke's Phytochemical and Ethnobotanical Databases (U.S. DEPARTMENT OF AGRICULTURE) https://phytochem.nal.usda.gov/phytochem/search
2- http://www.botanical.com

Template for Course Plan (Syllabus) of Phytochemistry (1)

I. - Information about Faculty Member Responsible for the Course:

		Office Hours					
Name of Faculty Member							
Location& Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Identification and General Information:

1	Course Title:	Phytochemistry (1)				
2	Course Number & Code:	**PHA374**				
3	Credit hours:	C.H				Total
		Th.	Seminar	Pr.	F. Tr.	
		2		1		3
4	Study level/year at which this course is offered:	Third Level, first semester				
5	Pre –requisite (if any):	Pharmacognosy (2)				
6	Co –requisite (if any):	**None**				
7	Program (s) in which the course is offered	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	Language of teaching the course:	English				
9	System of Study:	semester				
10	Mode of delivery:	Regular				
11	Location of teaching the course:	University				

III. Course Description:

This course focuses on the study of active ingredients of crude drugs based on chemical classification (carbohydrates, glycosides, tannins, bitter principles and natural toxins). The study includes methods of isolation, identification, qualitative and quantitative evaluation, medicinal uses, physical and chemical properties, biosynthetic pathway and chemical structure activity relationship. This course also includes practical part.

IV. Course Objectives:

At the end of the course, the student will be able to

1- Gain valuable knowledge about the chemistry and biological sources of carbohydrates, glycosides, tannins and natural toxins

2- Master the different methods of isolation and characterization of naturally occurring compounds as carbohydrates, glycosides, tannins, bitter principles and natural toxins as well as their pharmacological potential.

3- Draw and discuss the biosynthetic pathways of the studded compounds.

4- Gain understanding of qualitative and quantitative estimation methods of carbohydrates, glycosides and tannins.

V. Intended learning outcomes (ILOs) of the course:

- Brief summary of the knowledge or skill the course is intended to develop:

1- Demonstrate the essential knowledge of extraction, isolation, purification, characterization, qualitative and quantitative determination of carbohydrates, glycosides, tannins, bitter principles and natural toxins as well as their pharmacological effects.
2- Recognize the biosynthetic pathway and draw the chemical structure of such biologically active compounds.
3- Design appropriate methods for isolation, purification, qualitative and quantitative determination of carbohydrates, glycosides, tannins and bitter principles as natural constituents.
4- Anticipate the physical, chemical and pharmacological properties of carbohydrates, glycosides, tannins, bitter principles and natural toxins.
5- Use the chemical and physical methods for carbohydrates, glycosides and tannins extraction, isolation and purification from their natural origin.
6- Conduct the appropriate method for the carbohydrates, glycosides and tannins qualitative and quantitative determination according to GLP guidelines.
7- Demonstrate time management, independent and team working, decision making and life-long learning skills.
8- Carry out private study, including direct study on specific topics, independent study from textbooks.

VI. Course Content:

- Distribution of Semester Weekly Plan of Course Topics/Items and Activities.

A – Theoretical Aspect:

Order	Topics List	Week Due	Contact Hours
1	Introduction to carbohydrates	1st	2

2	Classification, separation, purification, qualitative and quantitative evaluation and medicinal uses of: monosaccharides	2nd	2
3	Classification, separation, purification, qualitative and quantitative evaluation and medicinal uses of: disaccharides	3rd	2
4	Separation, purification, qualitative identification and medicinal uses of homo-polysaccharides	4th	2
5	Separation, purification, qualitative identification and medicinal uses of hetero polysaccharides and polysaccharide containing amino-sugar units	5th	2
6	Introduction to glycosides	6th	2
7	**Mid-term Exam**	7th	2
8	**Simple Phenolic glycosides**: separation, purification, identification, quantitative and quantitative evaluation and their medicinal uses.	8th	2
9	**Anthracene glycosides**: separation, purification, identification, quantitative and quantitative evaluation and their medicinal uses.	9th	2
10	**Flavonoids glycosides**: separation, purification, identification, quantitative and quantitative evaluation and their medicinal uses.	10th	2
11	**Cardiac glycosides:** separation, purification, identification, quantitative and quantitative evaluation and their medicinal uses.	11th	2
12	**Terpenoid glycosides:** separation, purification, identification, quantitative and quantitative evaluation and their medicinal uses.	12th	2
13	**Tannins**: Introduction, classification and study of differentclasses and biological activities	13th	2
14	**Bitter principles** Introduction, classification and study of different classes and biological activities	14th	2
15	**Natural toxins** Introduction, classification and study of different classes and biological activities	15th	2
16	**Final Term exam**	16th	2
Number of Weeks /and Units Per Semester		**16**	**32**

B – Practical Aspect:			
Order	**Topics List**	**Week Due**	**Contact Hours**
1	Qualitative identification of carbohydrates (Monosaccharide, Disaccharides)	1st	**2**
2	Qualitative identification of carbohydrates (Polysaccharides)	2nd	**2**
3	General scheme for analysis of carbohydrate, and unknowns	3rd	**2**
4	Carbohydrate Assay; Quantitative estimation of Sugars Assay of glucose (Copper reduction and enzymatic methods)	4th	**2**
5	Carbohydrate Assay; Quantitative estimation of Sugars Assay of glucose and fructose mixture (Copper reduction and iodimertric method)	5th	**2**
6	Carbohydrate Assay; Quantitative estimation of Sugars Assay of glucose and Sucrose mixture (Direct copper reduction and copper reduction method after hydrolysis) Assay of glucose and maltose mixture	6th	**2**
7	Qualitative identification of glycosides: (Anthraquinones, cyanogen and Flavonoids)	7th	**2**
8	Qualitative identification of cardiac glycosides	8th	**2**
9	Qualitative identification of tannins and bitter principles	9th	**2**
10	Preliminary phytochemical screening of unknown drugs	10th	**2**
11	Quantitative estimation of glycosides (Colorimetric estimation of digitalis glycosides by Baljet's reagent)	11th	**2**
12	Presentation of the assignment.	12th	**2**
13	Revision	13th	**2**
14	Practical exam	14th	**2**
Number of Weeks /and Units Per Semester		**14**	**28**

VII. Teaching strategies of the course:

Lecture and group discussion
Problem based learning,
Practical (lab) classes, Laboratory work
Assignment
Problem-based Learning

VIII. Assignments:

No	Assignments	Week Due	Mark
1	lab report	1-6, 8-12	10%
2	Research assignment	13	5%

IX. Schedule of Assessment Tasks for Students During the Semester:

Assessment	Type of Assessment Tasks	Week Due	Mark	Proportion of Final Assessment
1	Attendance/quiz	All	5	5%
2	Lab activity reports	1-6, 8-12	10	%10
3	Med- Term Exam	7	10	10%
4	Research assignment	13	5	5%
5	Practical exam	14	30	30%
6	Final written exam	16	40	40%
	Total		100	100%

X. Learning Resources:

1- Required Textbook(s) (maximum two).

1- Evans, William Charles, Evans, Daphne, & Trease, George Edward. (2009). Trease and Evans pharmacognosy (16th ed. / rev. with the assistance of Daphne Evans.). Saunders/Elsevier.
2- Shah Biren N., Seth A.K. (2010). Textbook of Pharmacognosy and Phytochemistry, First Edition, Elsev

2- Essential References.

1- Dewick P. M. (2009)"Medicinal Natural Products, a Biosynthetic Approach", 3rd edition. John Wiley & sons.
2- Harborne J. B. (1984) Phytochemical Methods A GUIDE TO MODERN TECHNIQUES OF PLANT ANALYSIS. (2nd edition). New York. Chapman and Hall.

3- Electronic Materials and Web Sites *etc*.

1- Dr. Duke's Phytochemical and Ethnobotanical Databases (U.S. DEPARTMENT OF AGRICULTURE) https://phytochem.nal.usda.gov/phytochem/search
2- http://www.botanical.com

XI. Course Policies:

1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam.
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** - Assignments and projects will be assessed individually unless the teacher request for group work.
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course.
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:**

Course Specification of Medicinal chemistry (2)

I. Course Identification and General Information:						
1	Course Title:	Medicinal chemistry (2)				
2	Course Code & Number:	**PHA333**				
3	Credit hours:	C.H				TOTAL
		Th.	Seminar	practical	Training.	
		2		1	-	3
4	Study level/ semester at which this course is offered:	3 rd year / 2nd semester				
5	Pre –requisite (if any):	Medicinal chemistry (1)				
6	Co –requisite (if any):	None				
7	Program (s) in which the course is offered:	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	Language of teaching the course:	English Language				
9	Study System	Semester-based				
10	Mode of delivery:	Regular				
11	Location of teaching the course:	University				
12	Prepared By:	Mohammed Hassan				

II. Course Description:

The course is concerned with chemical structure, nomenclature, synthesis, classification, metabolism, uses and structure activity relationship (SAR) of diuretics, cardiovascular drugs, β-lactam antibiotics, tetracyclines, macrolides, aminoglycosides, lincomycin, sulfonamides, antifungals and antiprotozoal agents. The practical part includes the qualitative and quantitative determination and synthesis of some drugs in this course.

III. Course Objectives:

This course aims to:

1. Provide students knowledge about the chemistry of studied drugs.
2. Comprehending the relationship between the chemical structure of these drugs and their physicochemical properties, pharmacokinetics, biological activity, together with their mode of action.
3. Learn students the skills in drug design using SAR of studied drugs.
4. Train students practical and professional skills.

IV. Course Intended learning outcomes (CILOs) of the course		WRITE Symbo and number o PILOs
After completing this course, students will be able to:		
a.1	Recognize the chemical classification, chemical structure, synthesis methods and mode of action of studied classes of drugs	**A2, A3**
a.2	Illustrate the structure activity relationship (SAR) and metabolism of studied drugs.	**A3**
a.3	Explain the physicochemical properties and their effect on pharmacokinetic and pharmacodynamic profile of studied drugs	
b.1	Predict the biological activity and metabolism pathways of drugs based on chemical structure.	**B1**
b.2	Select appropriate methods for the identification and analysis of various drugs.	**B2**
c.1	Perform identification, assay and synthesis of selected drugs.	**C1**
c.2	Apply the given information to evaluate the activity of related drugs based on structural similarities and dissimilarities.	**C1**
d.1	Demonstrate critical thinking, decision making, team working, communication and research skills.	**D1, D3**

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
After completing this course, students will be able to:	- Lectures and Groups discussion - tutorial. - Simulation	- In-class participation - Quizzes - Homework, Reports. - Written exam.
a1- Recognize the chemical classification, chemical structure, synthesis methods and mode of action of studied classes of drugs		
a2- Illustrate the structure activity relationship (SAR) and metabolism of studied drugs.		
a3- Explain the physicochemical properties and their effect on pharmacokinetic and pharmacodynamic profile of studied drugs		

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
After completing this course, students will be able to:	- Lectures and Groups discussion. - Problem solving Sessions. - Brainstorming - practical sessions	- In-class participation - Quizzes - Homework, Reports. - Written exam.
b1- Predict the biological activity and metabolism pathways of drugs based on chemical structure.		
b2- Select appropriate methods for the identification and analysis of various drugs.		

(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
After completing this course, students will be able to:	- Group discussion. - Practical classes - Problem solving Sessions - Simulation	Practical works, Homework, practical exam and practical reports.
c1- Perform identification, assay and synthesis of selected drugs.		
c2- Apply the given information to evaluate the activity of related drugs based on structural similarities and dissimilarities.		

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
After completing this course, students will be able to:	- Groups discussions. - Practical classes - Seminar - Research in library and web. - Self –learning	- Presentation & discussion - Homework Evaluation. - Reports' Evaluation.
d1- Demonstrate critical thinking, decision making, team working, communication and research skills.		

V. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Learning Outcomes	Sub Topics List	No. of Weeks	contact hours
1	Diuretics	a1, a2, a3, b1,d1	Osmotics, CAI, Thiazides, Loop,	1	2

			K-Sparing diuretics		
2	Cardiovascular drugs	a1, a2, a3, b1, d1	Antihypertensive drugs: centrally and peripherally acting drugs, ACEIs, β-blockers, CCB	1	2
3	Cardiovascular drugs	a1, a2, a3, b1, d1	Antianginal & Heart Failure	1	2
4	Cardiovascular drugs	a1, a2, a3, b1, d1	Antiarrhythmic & Antihyperlipidemic drugs	1	2
5	Cardiovascular drugs	a1, a2, a3, b1, d1	Anticoagulant drugs Cardiac glycosides	1	2
6	Sulfonamides & Quinolones	a1, a2, a3, b1, c2, d1	Classification, MoA, SAR, synthesis. metabolism	1	2
7	Midterm	a1, a2, a3, b1, c2		1	2
8	β-lactam antibiotics	a1, a2, a3, b1, c2, d1	Classification, MoA, SAR, synthesis, metabolism	3	6
9	Tetracycline & Aminoglycoside	a1, a2, a3, b1, c2, d1	Classification, MoA, SAR, synthesis, metabolism	1	2
10	Lincomycin, Macrolides	a1, a2, a3, b1, c2, d1	Classification, MoA, SAR, synthesis, metabolism	1	2
11	Antifungal agents	a1, a2, a3, b1, c2, d1	Classification, MoA, SAR, synthesis, metabolism	1	2
12	Antiprotozoal agents	a1, a2, a3, b1, c2, d1	- 4-Amino quinolones, - Antibiotics, - Haloacetamides, - 8-Hydroxy quinolones, - Ipecac alkaloids, - 5-Nitro imidazoles, - Organo-arsenicals and - Miscellaneous	2	4
13	Final Exam	a1, a2, a3, b1, c2		1	2
Number of Weeks /and Units Per Semester				**16**	**32**

B- Practical Aspect:				
Order	**Tasks/ Experiments**	**No. of Weeks**	**contact hours**	**Learning Outcomes**
1	**Introduction and Laboratory safety**	**1**	**2**	a1, b2, c1, c2, d1
2	Quantitative estimation of Warfarin sodium tab	**1**	**2**	b2, c1, c2, d1
3	Assay of furosemide tab	**1**	**2**	b2, c1, c2, d1
4	Assay of furosemide inj	**1**	**2**	b2, c1, c2, d1
5	Identification and assay of verapamil	**1**	**2**	b2, c1, c2, d1
6	Assay of Ampicillin	**1**	**2**	b2, c1, c2, d1
7	Assay of nalidaxic acid syrup	**1**	**2**	b2, c1, c2, d1
8	Assay of rifampicin cap	**1**	**2**	b2, c1, c2, d1
9	Assay of Metronidazole	**1**	**2**	b2, c1, c2, d1
10	Assay of Hexamine	**1**	**2**	b2, c1, c2, d1
11	Identification of Albendazole	**1**	**2**	b2, c1, c2, d1
12	Synthesis of aspirin	**1**	**2**	a1, b2, c1, c2, d1
13	Synthesis of paracetamol	**1**	**2**	a1, b2, c1, c2, d1
14	Final Exam	**1**	**2**	a1, b2, c1, c2
Number of Weeks /and Units Per Semester		**14**	**28**	

VI. Teaching strategies of the course:

- Lectures and Groups discussion
- tutorial.
- Simulation
- Problem solving Sessions.
- Brainstorming
- Practical classes
- Seminar
- Research in library and web.
- Self –learning

VII. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Activities	a3, b1, c2, d1	Every 2 weeks	5

VIII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Assignments	Every 2 weeks	5	5%	a3, b1, c2, d1
2	Quizzes	4	5	5%	a1, a2, a3, b1
3	Mid-Term Exam	8	10	10%	a1, a2, a3, b1, c2
5	Practical lab work	Every week	10	10%	a1, b2, c1, c2, d1
6	Final exam of Practical	14	30	30%	a1, b2, c1, c2
7	Final exam of Theoretical	16	40	40%	a1, a2, a3, b1, c2
	Total		**100**	**100%**	

IX. Learning Resources:

1- Required Textbook(s) (maximum two).

1- John M. Beale, Jr. and John H. Block, 2011, "Text book of Organic Medicinal and Pharmaceutical Chemistry" 12th Edition, Wilson and Gisvold, Lippincott Williams and Wilkins, A Wolters Kluwer Company, Philadelphia.

2- Graham L. Patrick, 2017, "An Introduction to Medicinal Chemistry" 5th Edition, Oxford University Press Inc, New York.

2- Essential References.

1- Thomas L. Lemke, Victoria F. Roche, David A. Willaiams and S. William Zito, 2008, "Foye's Principles of Medicinal Chemistry" 6 th, Edition, Lippincott Williams & Wilkins, a Wolters Kluwer business, Philadelphia.

2- Thomas Nogrady, Donald F. Weaver, 2005, Medicinal Chemistry A Molecular and Biochemical Approach, 3rd edition, Oxford University Press, Inc., New York.

3- Donald J. Abraham," BURGER'S Medicinal Chemistry and Drug Discovery" 6 th edition, A John Wiley and Sons, Inc, Virginia.

3- Electronic Materials and Web Sites *etc*.
1- www. Pharmchem. Ku.edu/ 2- http://www.chemaxon/marvin 3- http://www.webmolecules.com 4-http://www.acdlabs.com 5-PASS Prediction of Activity Spectra for Substance) (http://www.ibmh.msk.su/PASS

X. Course Policies:	
1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects**: - Assignments and projects will be assessed individually unless the teacher request for group work
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the faculty rules.
7	**Other policies**:

Template for Course Plan (Syllabus) of Medicinal chemistry (2)

I. - Information about Faculty Member Responsible for the Course:

		Office Hours					
Name of Faculty Member							
Location& Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Identification and General Information:

1	Course Title:	**Medicinal chemistry (2)**				
2	Course Code & Number:	**PHA333**				
3	Credit hours:	C.H				TOTAL
		Th.	Seminar	practical	Training.	
		2		1	-	3
4	Study level/ semester at which this course is offered:	3 rd year / 2nd semester				
5	Pre –requisite (if any):	Medicinal chemistry (1)				
6	Co –requisite (if any):	None				
7	Program (s) in which the course is offered:	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	Language of teaching the course:	English Language				
9	Study System	Semester-based				
10	Mode of delivery:	Regular				
11	Location of teaching the course:	University				

III. Course Description:

The course is concerned with chemical structure, nomenclature, synthesis, classification, metabolism, uses and structure activity relationship (SAR) of diuretics, cardiovascular drugs, β-lactam antibiotics, tetracyclines, macrolides, aminoglycosides, lincomycin, sulfonamides, antifungals and antiprotozoal agents. The practical part includes the qualitative and quantitative determination and synthesis of some drugs in this course.

IV. Course Objectives:

This course aims to:

1. Provide students knowledge about the chemistry of studied drugs.
2. Comprehending the relationship between the chemical structure of these drugs and their physicochemical properties, pharmacokinetics, biological activity, together with their mode of action.
3. Learn students the skills in drug design using SAR of studied drugs.
4. Train students practical and professional skills.

V. Course Intended learning outcomes (CILOs) of the course

After completing this course, students will be able to:

1	Recognize the chemical classification, chemical structure, synthesis methods and mode of action of studied classes of drugs
2	Illustrate the structure activity relationship (SAR) and metabolism of studied drugs.
3	Explain the physicochemical properties and their effect on pharmacokinetic and pharmacodynamic profile of studied drugs
4	Predict the biological activity and metabolism pathways of drugs based on chemical structure.
5	Select appropriate methods for the identification and analysis of various drugs.
6	Perform identification, assay and synthesis of selected drugs.
7	Apply the given information to evaluate the activity of related drugs based on structural similarities and dissimilarities.
8	Demonstrate critical thinking, decision making, team working, communication and research skills.

VI. Course Content:

A – Theoretical Aspect:

Order	Topics List	Weeks Due	contact hours
1	**Diuretics** ▪ Osmotics, CAI, Thiazides, Loop, K-Sparing diuretics	1	2
2	**Cardiovascular drugs**	2	2

	▪ Antihypertensive drugs: centrally and peripherally acting drugs, ACEIs, β-blockers, CCB		
3	**Cardiovascular drugs** ▪ Antianginal & ▪ Heart Failure	3	2
4	**Cardiovascular drugs** ▪ Antiarrhythmic & ▪ Antihyperlipidemic drugs	4	2
5	**Cardiovascular drugs** ▪ Anticoagulant drugs ▪ Cardiac glycosides	5	2
6	**Sulfonamides & Quinolones** ▪ Classification, MoA, SAR, synthesis. metabolism	6	2
7	**Midterm**	7	2
8	**β-lactam antibiotics** ▪ Classification, MoA, SAR, synthesis, metabolism	8, 9, 10	6
9	**Tetracycline & Aminoglycoside** ▪ Classification, MoA, SAR, synthesis, metabolism	11	2
10	**Lincomycin, Macrolides** ▪ Classification, MoA, SAR, synthesis, metabolism	12	2
11	**Antifungal agents** ▪ Classification, MoA, SAR, synthesis, metabolism	13	2
12	**Antiprotozoal agents** ▪ 4-Amino quinolones, Antibiotics, Haloacetamides, 8-Hydroxy quinolones, Ipecac alkaloids, 5-Nitro imidazoles, Organo-arsenicals and Miscellaneous	14, 15	4
13	**Final Exam**	16	2
Number of Weeks /and Units Per Semester		16	32

B - Practical Aspect:

Order	Tasks/ Experiments	No. of Weeks	contact hours
1	**Introduction and Laboratory safety**	1	2
2	Quantitative estimation of Warfarin sodium tab	2	2
3	Assay of furosemide tab	3	2

4	Assay of furosemide inj	4	2
5	Identification and assay of verapamil	5	2
6	Assay of Ampicillin	6	2
7	Assay of nalidaxic acid syrup	7	2
8	Assay of rifampicin cap	8	2
9	Assay of Metronidazole	9	2
10	Assay of Hexamine	10	2
11	Identification of Albendazole	11	2
12	Synthesis of aspirin	12	2
13	Synthesis of paracetamol	13	2
14	Final Exam	14	2
Number of Weeks /and Units Per Semester		14	28

VII. Teaching strategies of the course:

- Lectures and Groups discussion
- tutorial.
- Simulation
- Problem solving Sessions.
- Brainstorming
- Practical classes
- Seminar
- Research in library and web.
- Self –learning

VIII. Assignments:

No	Assignments	Week Due	Mark
1	Activities	Every 2 weeks	5

IX. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Assignments	Every 2 weeks	5	5%	
2	Quizzes	4	5	5%	
3	Mid-Term Exam	8	10	10%	
5	Practical lab work	Every week	10	10%	
6	Final exam of Practical	14	30	30%	
7	Final exam of Theoretical	16	40	40%	
	Total		**100**	**100%**	

X. Learning Resources:

1- Required Textbook(s) (maximum two).

1- John M. Beale, Jr. and John H. Block, 2011, "Text book of Organic Medicinal and Pharmaceutical Chemistry" 12th Edition, Wilson and Gisvold, Lippincott Williams and Wilkins, A Wolters Kluwer Company, Philadelphia.
2- Graham L. Patrick, 2017, "An Introduction to Medicinal Chemistry" 5th Edition, Oxford University Press Inc, New York.

2- Essential References.

1- Thomas L. Lemke, Victoria F. Roche, David A. Willaiams and S. William Zito, 2008, "Foye's Principles of Medicinal Chemistry" 6 th, Edition,., Lippincott Williams & Wilkins, a Wolters Kluwer business, Philadelphia.
2- Thomas Nogrady, Donald F. Weaver, 2005, Medicinal Chemistry A Molecular and Biochemical Approach, 3rd edition, Oxford University Press, Inc., New York.
3- Donald J. Abraham," BURGER'S Medicinal Chemistry and Drug Discovery" 6 th edition, A John Wiley and Sons, Inc, Virginia.

3- Electronic Materials and Web Sites *etc*.

1- www. Pharmchem. Ku.edu/
2- http://www.chemaxon/marvin
3- http://www.webmolecules.com
4-http://www.acdlabs.com
5-PASS Prediction of Activity Spectra for Substance) (http://www.ibmh.msk.su/PASS).

XI.	Course Policies:
1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam.
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** - Assignments and projects will be assessed individually unless the teacher request for group work.
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course.
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:**

Course Specification of Pharmaceutical Instrumental Analysis

I.Course Identification and General Information:

1	**Course Title:**	**Pharmaceutical Instrumental Analysis**				
2	**Course Code & Number:**	**PHA334**				
3	**Credit hours:**	C.H				TOTAL
		Th.	Seminar	practical	Training.	
		2		1		3
4	**Study level/ semester at which this course is offered:**	Third level, second semester				
5	**Pre –requisite (if any):**	Analytical Chemistry				
6	**Co –requisite (if any):**	None				
7	**Program (s) in which the course is offered:**	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	**Language of teaching the course:**	English				
9	**Study System**	Semester-based				
10	**Mode of delivery:**	Regular				
11	**Location of teaching the course:**	University				
12	**Prepared By:**	Dr. Abdulkader Qahtan				

II. Course Description:

This course introduces the student to spectral methods of analysis including UV-Visible, atomic absorption, flame emission, Infra-Red (IR), Nuclear Magnetic Resonance (NMR), and flourimetry. Also covers separation techniques (chromatography), in addition to electrochemical principles (conductometry, potentiometry, polarograghy). The course also includes practical part.

III. Course Objectives:

This course aims

1. To reinforce the basic chemical principles attained in the prerequisites that are particularly important to instrumental analysis.
2. To learn the theory of, operation, application and data interpretation for many types of instruments used for qualitative and quantitative determination in the pharmaceutical analytical sciences which includes chromatographic, spectroscopic and electrochemical techniques.
3. To develop the skills that are necessary to solve analytical problems related to instrumental techniques.

IV. Course Intended learning outcomes (CILOs) of the course		WRITE Symbol and number of PILOs
After completing this course, students will be able to:		
a.1	Understand the basic concepts of spectrometric, electrometric and chromatographic techniques that deal with separation and identification of chemical and pharmaceutical molecules.	A1
a.2	Recognize the theory of operation, application and data interpretation for many types of instruments used for instrumental methods.	A2
b.1	Develop and Design suitable methods for separation, identification, preparation and standardization of chemical substances and pharmaceutical products.	B2
b.2	Select appropriate instrumental method to qualitative and quantitative analysis of pharmaceutical products.	B3
c.2	Practice the proper method for operating standard instrumentation and solve pharmaceutical problems with spectrometric, electrometric and chromatographic methods.	C1
c.2	Comply with the ethics during the processes of separation, identification and standardization of active substances from various sources for therapeutic uses.	C5
d.1	Demonstrate critical thinking, problem- solving, and decision making, when dealing with theoretical and practical information in this course.	D2
d.2	Apply the information technology skills, such as word processing and internet communication and online searches.	D3

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:		
Knowledge and Understanding	Teaching strategies	Assessment Strategies
After completing this course, students will be able to:	Lecture, Tutorials Interactive class discussions, seminar, Practical sessions	Written exam, Problem-solving exercise
a1- Understand the basic concepts of spectrometric, electrometric and chromatographic techniques that deal with separation and identification of chemical and pharmaceutical molecules.		
a2- Recognize the theory of operation, application and data interpretation for many types of instruments used for instrumental methods.		

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Intellectual Skills	Teaching strategies	Assessment Strategies
After completing this course, students will be able to:	Lecture, Practical sessions, Problem-solving exercises, Case study	Written exam, Problem – solving exercise, presentation Practical exam
b1- Develop and Design suitable methods for separation, identification, preparation and standardization of chemical substances and pharmaceutical products.		
b2- Select appropriate instrumental method to qualitative and quantitative analysis of pharmaceutical products.		

(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		
Professional and Practical Skills	Teaching strategies	Assessment Strategies
After completing this course, students will be able to:	Lecture, Interactive class discussions, Practical sessions, laboratory wok	Written & Practical exam, Problem – solving exercise, presentation, laboratory report
c1- Practice the proper method for operating standard instrumentation and solve pharmaceutical problems with spectrometric, electrometric and chromatographic methods.		
c2- Comply with the ethics during the processes of separation, identification and standardization of active substances from various sources for therapeutic uses.		

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:		
General and Transferable Skills:	Teaching strategies	Assessment Strategies
After completing this course, students will be able to:	Lecture, Interactive class discussions, exercises, seminar, , Practical sessions, filed training	Written & Practical exam, Problem – solving exercise, presentation, laboratory report
d1- Demonstrate critical thinking, problem- solving, and decision making, when dealing with theoretical and practical information in this course.		
d2- Apply the information technology skills, such as word processing and internet communication and online searches.		

V. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Learning Outcomes	Sub Topics List	No. of Weeks	contact hours
1	**Introduction to Instrumental Analysis**	a1,a2	- Classification of analytical methods - Types of instrumental methods - Basic concepts and importance of instrumental methods - Role of instrumental methods in pharmaceutical analysis - Criteria of reliable analytical methods. - Basics of instruments in instrumental analysis. - Types of Error in experimental data	1	2
2	**Electrochemistry**	a1,a2,,b1,b2	- Basic concepts of electrochemistry i.e. how potential difference is developed across a membrane. - Electrochemical cell & cell potential **Potentiometry:** - Types of electrodes - pH measurement. - potentiometric titration of acids and bases. - Applications **Conductometry:** - Conductimetric titration of acids and bases. - **Polarimetry:** - Basic concepts of polarimetry**.** – Polarometer.	1	2
3	**UV-VIS spectroscopy**	a1,a2,,b1,b2	- Basic concepts of Spectroscopy - Types of radiation and interaction with matter - Theory of excitation and structural requirements for light absorption. - Beer's law and Beer's law limitations - Single & double beam spectroscopy - Parameters of UV-Vis spectroscopy - Detectors - Quantitative and qualitative uses of UV/ Vis. e.g. determination of drugs in a mixture.	1	2

4		a1,a2,,b1,b2	- Effect of solvents and pH on spectra. - Potential effects of different instrumental factors like stray light and chemical factors like the nature of the sample being measured.	1	2
5	**Luminescence Molecular Spectroscopy**	a1,a2,,b1,b2	- Fluorescence and phosphorescence origin, excited and ground state. - Effect of structure, temperature and solvent. - Basic design of a pectrofluorometer and applications.	1	2
6	**Mid-Term exam**	a1,a2, b1,b2, d1, d2		1	2
7	**Atomic Emission and Atomic Absorption Spectroscopy**	a1,a2, b1,b2, d1, d2	- Introduction and Theory - Instrumentation - Qualitative and quantitative analysis - Calibration curve - Basic design of AAS - Hollow cathode lamp.	1	2
8	**Infra-Red Spectroscopy (IR)**	a1,a2, b1,b2, d1, d2	- Basic concepts of IR spectroscopy. - Instrumentation - The modes of vibrations, bands - IR absorptions and emissions - Characteristics of an IR Spectrum - Interpreting IR spectra - IR spectra of different organic compounds - Analytical applications	1	2
9	**NMR Spectroscopy**	a1, a2, b1,b2, d1, d2	- Theory of NMR - Design of NMR - Characteristics of ^{1}H NMR spectrum - Chemical shift - Shielding and deshielding - NMR spectrometer - Interpreting NMR spectra - Diamagnetic anisotropy - Integration of ^{1}H NMR absorption - Spin-spin splitting in ^{1}H NMR - Application of ^{1}H NMR	1	2
10		a1,a2, b1,b2, d1, d2	- ^{13}C NMR - Two dimensional NMR spectra. - Applications	1	2

11	**Mass Spectroscopy**	a1,a2, b1,b2, d1, d2	- Mass spectrometer, mass spectrum, - Fragmentation. - Application	1	2
12	**Chromatographic Techniques**	a1,a2, b1,b2, d1, d2	- Theory of chromatography - Types of chromatographic methods - Scope of Thin Layer Chromatography (TLC) - Principles and application of TLC - Column chromatography - Data interpretation - Chromatographic parameters: retention time, peak width, resolution etc - Column efficiency - Van Deeemter Equation - Application	1	2
13	**High-Performance Liquid Chromatography (HPLC)**	a1,a2, b1,b2, d1, d2	▪ Scope of HPLC ▪ Column efficiency in liquid chromatography ▪ Instruments for liquid chromatography ▪ Mobile phase ▪ Sample injection ▪ Pumps ▪ Columns ▪ Normal & reversed phases ▪ Isocratic & gradient elution ▪ HPLC Detectors ▪ Retention factors ▪ Analytical applications	1	2
14	**Gas Chromatography (GC), Capillary electrophoresis**	a1,a2, b1,b2, d1, d2	▪ Theory and principles of GC ▪ GSC and GLC ▪ Instruments for GC ▪ Detection systems ▪ Analytical application of GLC ▪ Theory of electrophoresis. ▪ CE instrumentation, EOF and migration times. ▪ Electropherogram . ▪ Analytical applications	1	2
15	**Final Exam**	a1,a2, b1,b2, d1, d2		1	2
Number of Weeks /and Units Per Semester				**15**	**30**

B - Practical Aspect:

Order	Experiments	No. of Weeks	contact hours	Learning Outcomes
1	Introduction to laboratory and safety rules.	1	2	a1,c1,c2
2	Assay of acetyl salicylic acid using potentiometric titration	1	2	a1,c1,c2
3	Conductimetric titration for the determination of a mixture of a strong acid and a weak acid.	1	2	b1,b2,c1,c2
4	- Determination of unknown concentration of glucose using polarimetry	1	2	b1,b2,c1,c2
5	Determination of the purity of paracetamol raw materials and tablets	1	2	b1,b2,c1,c2,d1
6	• Effect of pH on phenol red spectrum (isosbestic point). • Effect of solvents on the absorption of phenol red.	1	2	b1,b2,c1,c2,d1,d2
7	Determination of benzene and toluene mixture using U.V. spectroscopy	2	4	b1,b2,c1,c2,d1
8	Determination of the purity of quinine sulfate using fluorescence spectroscopy.	1	2	b1,b2,c1,c2,d1
9	Assay of sodium and potassium ions in an IV infusion using flame photometry.	1	2	b1,b2,c1,c2,d2
10	Work shops on the interpretation of IR spectra, ^{1}H NMR spectra and ^{13}C NMR spectroscopy	3	6	b1,b2,c1,c2,c3,d2
11	Determination of paracetamol in suspension using HPLC based on B.P. monograph.	1	2	b1,b2,c1,c2,c3,d2
12	**Final Exam**	1	2	a1,b1,b2,c1,c2,c3,d2
Number of Weeks /and Units Per Semester		**15**	**30**	

VI. Teaching strategies of the course:

Lecture,
Tutorials
Interactive class discussions,
seminar,
Practical sessions, laboratory wok
Problem- solving exercises,
Case study
Filed training

VII. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Assignments	a1,a2,b1,b2,c1,c2,d1,d2	2,6,9	10

VIII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Assignments	2,6,9	10	10%	a2,b1,b2,c1,d1,d2
2	Mid-term Exam	6	10	10%	a1,a2,b1,b2,d2
	Practical work and report	all	10	10%	c1,c2,d1,d2
3	Practical Exam	15	30	30%	b1,b2,c1,c2,d1,d2
4	Final-Term Exam	15	40	40%	a1,a2,b1,b2,d1
5	Total		100	100%	

IX. Learning Resources:

1- Required Textbook(s) (maximum two).

1- Douglas A.Skoog and James J.Leary, 1992,'Principles of Instrumental Analysis' , Saunders College Publishing , U.S.A.
2 - David Watson, Elsevier , 2012, A Textbook for Pharmacy Students and Pharmaceutical Chemists, 3rd edition, / Churchill Livingstone.
3 - Robert M. Silverstein, Francis X. Webster and David Kiemle , John Wiley, 2005, Spectrometric Identification of Organic Compounds, 7th edition, , & Sons.

2- Essential References.

1- Dudley Williams, Ian Fleming, Spectroscopic Methods in Organic Chemistry, 6th editior McGraw-Hill book company, 1995.
2- L. D. Field, S. Sternhell and J. R. Kalman, John Wiley, 2002 ,Organic Structures from Spectra, 3rd edition, & Sons,.
3 - Robert M. Silverstein, Francis X. Webster and David Kiemle, John Wiley, 2005 ,Spectrometric Identification of Organic Compounds, 7th edition, & Sons.
4 - Skoog, D. A., Brooks, 2007, Principles of Instrumental Analysis, 6th edition, / Cole Thomson Learning.

3- Electronic Materials and Web Sites *etc.*

1- boratory Design Modern Chemistry La
2- http://www.iingroups.com/idl(springer)
3- http://www.4chem.com/vb3
4- www.sciencedirect.com
5- ox.ac.uk/vrchemistry/openpage.htmlhttp://www.chem

	X. Course Policies:
1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects**: - Assignments and projects will be assessed individually unless the teacher request for group work
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the faculty rules.
7	**Other policies**: -

Template for Course Plan (Syllabus) of Pharmaceutical Instrumental Analysis

I. - Information about Faculty Member Responsible for the Course:

		Office Hours					
Name of Faculty Member							
Location& Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Identification and General Information:

1	**Course Title:**	Pharmaceutical Instrumental Analysis				
2	**Course Code & Number:**	**PHA334**				
3	**Credit hours:**	C.H				TOTAL
		Th.	Seminar	practical	Training.	
		2		1		3
4	**Study level/ semester at which this course is offered:**	Third level, second semester				
5	**Pre –requisite (if any):**	Analytical Chemistry				
6	**Co –requisite (if any):**	None				
7	**Program (s) in which the course is offered:**	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	**Language of teaching the course:**	English				
9	**Study System**	Semester-based				
10	**Mode of delivery:**	Regular				
11	**Location of teaching the course:**	University				

III. Course Description:

This course introduces the student to spectral methods of analysis including UV-Visible, atomic absorption, flame emission, Infra-Red (IR), Nuclear Magnetic Resonance (NMR), and flourimetry. Also covers separation techniques (chromatography), in addition to electrochemical principles (conductometry, potentiometry, polarograghy). The course also includes practical part.

IV. Course Objectives:

This course aims

1. To reinforce the basic chemical principles attained in the prerequisites that are particularly important to instrumental analysis.
2. To learn the theory of, operation, application and data interpretation for many types of instruments used for qualitative and quantitative determination in the pharmaceutical analytical sciences which includes chromatographic, spectroscopic and electrochemical techniques.
3. To develop the skills that are necessary to solve analytical problems related to instrumental techniques.

V. Course Intended learning outcomes (CILOs) of the course

	After completing this course, students will be able to:
1	Understand the basic concepts of spectrometric, electrometric and chromatographic techniques that deal with separation and identification of chemical and pharmaceutical molecules.
2	Recognize the theory of operation, application and data interpretation for many types of instruments used for instrumental methods.
3	Develop and Design suitable methods for separation, identification, preparation and standardization of chemical substances and pharmaceutical products.
4	Select appropriate instrumental method to qualitative and quantitative analysis of pharmaceutical products.
5	Practice the proper method for operating standard instrumentation and solve pharmaceutical problems with spectrometric, electrometric and chromatographic methods.
6	Comply with the ethics during the processes of separation, identification and standardization of active substances from various sources for therapeutic uses.
7	Demonstrate critical thinking, problem- solving, and decision making, when dealing with theoretical and practical information in this course.
8	Apply the information technology skills, such as word processing and internet communication and online searches.

VI. Course Content:

A – Theoretical Aspect:

Order	Topics List	Weeks due	contact hours
1	**Introduction to Instrumental Analysis** - Classification of analytical methods - Types of instrumental methods - Basic concepts and importance of instrumental methods	1	2

	- Role of instrumental methods in pharmaceutical analysis - Criteria of reliable analytical methods. - Basics of instruments in instrumental analysis. - Types of Error in experimental data.		
2	**Electrochemistry** - Basic concepts of electrochemistry i.e. how potential difference is developed across a membrane. - Electrochemical cell and cell potential **Potentiometry:** - Types of electrodes - pH measurement. - potentiometric titration of acids and bases. - Applications **Conductometry:** - Conductimetric titration of acids and bases. - **Polarimetry:** - Basic concepts of polarimetry**.** – Polarometer.	2	2
3	**UV-VIS spectroscopy** - Basic concepts of Spectroscopy - Types of radiation and interaction with matter - Theory of excitation and structural requirements for light absorption. - Beer's law and Beer's law limitations - Single & double beam spectroscopy - Parameters of UV-Vis spectroscopy - Detectors - Quantitative and qualitative uses of UV/ Vis. e.g. determination of drugs in a mixture.	3	2
4	- Effect of solvents and pH on spectra. - Potential effects of different instrumental factors like stray light and chemical factors like the nature of the sample being measured.	4	2
5	**Luminescence Molecular Spectroscopy** - Fluorescence and phosphorescence origin, excited and ground state. - Effect of structure, temperature and solvent. - Basic design of a spectrofluorometer and applications.	5	2
6	**Mid-Term exam**	6	2
7	**Atomic Emission and Atomic Absorption Spectroscopy**	7	2

	- Introduction and Theory - Instrumentation - Qualitative and quantitative analysis - Calibration curve - Basic design of AAS - Hollow cathode lamp.		
8	**<u>Infra-Red Spectroscopy (IR)</u>** - Basic concepts of IR spectroscopy. - Instrumentation - The modes of vibrations, bands - IR absorptions and emissions - Characteristics of an IR Spectrum - Interpreting IR spectra - IR spectra of some organic compounds - Analytical applications	8	2
9	**<u>NMR Spectroscopy</u>** - Theory of NMR - Design of NMR - Characteristics of ^{1}H NMR spectrum - Chemical shift - Shielding and deshielding - NMR spectrometer - Interpreting NMR spectra - Diamagnetic anisotropy - Integration of ^{1}H NMR absorption - Spin-spin splitting in ^{1}H NMR - Application of ^{1}H NMR spectroscopy	9	2
10	- ^{13}C NMR - Two dimensional NMR spectra. - Applications	10	2
11	**<u>Mass Spectroscopy</u>** - Mass spectrometer, mass spectrum, - Fragmentation. - Application	11	2
12	**<u>Chromatographic Techniques</u>** - Theory of chromatography - Types of chromatographic methods - Scope of Thin Layer Chromatography (TLC) - Principles and application of TLC - Column chromatography - Data interpretation - Chromatographic parameters: retention time, peak width, resolution etc - Column efficiency	12	2

	- Van Deeemter Equation - Qualitative and quantitative analysis by chromatography		
13	**<u>High-Performance Liquid Chromatography (HPLC)</u>** ▪ Scope of HPLC ▪ Column efficiency in liquid chromatography ▪ Instruments for liquid chromatography ▪ Mobile phase ▪ Sample injection ▪ Pumps ▪ Columns ▪ Normal & reversed phases ▪ Isocratic & gradient elution ▪ HPLC Detectors ▪ Retention factors ▪ Analytical applications	13	2
14	**<u>Gas Chromatography (GC), Capillary electrophoresis</u>** ▪ Theory and principles of GC ▪ GSC and GLC ▪ Instruments for GC ▪ Detection systems ▪ Analytical application of GLC ▪ Theory of electrophoresis. ▪ CE instrumentation, EOF and migration times. ▪ Electropherogram . ▪ Analytical applications	14	2
15	**Final Exam**	15	2
Number of Weeks /and Units Per Semester		**15**	**30**

B- Practical Aspect:

Order	Tasks/ Experiments	Weeks due	contact hours
1	Introduction to laboratory and safety rules.	**1**	**2**
2	Assay of acetyl salicylic acid using potentiometric titration	**1**	**2**
3	Conductimetric titration for the determination of a mixture of a strong acid and a weak acid.	**1**	**2**
4	- Determination of unknown concentration of glucose using polarimetry	**1**	**2**
5	Determination of the purity of paracetamol raw materials and tablets	**1**	**2**
6	• Effect of pH on phenol red spectrum (isosbestic point). • Effect of solvents on the absorption of phenol red.	**1**	**2**
7	Determination of benzene and toluene mixture using U.V. spectroscopy	**2**	**4**

8	Determination of the purity of quinine sulfate using fluorescence spectroscopy.	**1**	**2**
9	Assay of sodium and potassium ions in an IV infusion using flame photometry.	**1**	**2**
10	Work shops on the interpretation of IR spectra, ^{1}H NMR spectra and ^{13}C NMR spectroscopy	**3**	**6**
11	Determination of paracetamol in suspension using HPLC based on B.P. monograph.	**1**	**2**
12	**Final Exam**	**1**	**2**
Number of Weeks /and Units Per Semester		**15**	**30**

VII. Teaching strategies of the course:

Lecture,
Tutorials
Interactive class discussions,
seminar,
Practical sessions, laboratory wok
Problem- solving exercises,
Case study
Filed training

VIII. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Assignments	a1,a2,a3,b1,b2,b3c1,c3,d1,d2,d3	2,6,9	5

IX. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment
1	Assignments	2,6,9	10	10%
2	Mid-term Exam	6	10	10%
3	Practical work and report	all	10	10%
4	Practical Exam	15	30	30%
5	Final-Term Exam	15	40	40%
6	Total		100	100%

X. Learning Resources:

1- Required Textbook(s) (maximum two).

1- Douglas A.Skoog and James J.Leary, 1992,'Principles of Instrumental Analysis' , Saunders College Publishing, U.S.A.
2- David Watson, Elsevier, 2012, A Textbook for Pharmacy Students and Pharmaceutical Chemists, 3rd edition, / Churchill Livingstone.
3- Robert M. Silverstein, Francis X. Webster and David Kiemle, John Wiley, 2005, Spectrometric Identification of Organic Compounds, 7th edition, & Sons.

2- Essential References.

1- Dudley Williams, Ian Fleming, Spectroscopic Methods in Organic Chemistry, 6th edition, McGraw-Hill book company, 1995.
2- L. D. Field, S. Sternhell and J. R. Kalman, John Wiley, 2002, Organic Structures from Spectra, 3rd edition, & Sons,
3- Robert M. Silverstein, Francis X. Webster and David Kiemle, John Wiley, 2005, Spectrometric Identification of Organic Compounds, 7th edition, & Sons.
4- Skoog, D. A., Brooks, 2007, Principles of Instrumental Analysis, 6th edition, / Cole Thomson Learn

3- Electronic Materials and Web Sites *etc*.

1- boratory Design Modern Chemistry La
2- http://www.iingroups.com/idl(springer)
3- http://www.4chem.com/vb3
4- www.sciencedirect.com
5- ox.ac.uk/vrchemistry/openpage.htmlhttp://www.chem

XI. Course Policies:

1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam.
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** - Assignments and projects will be assessed individually unless the teacher request for group work.
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course.
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the faculty rules.

Course Specification of Biopharmaceutics

I. Course Identification and General Information:						
1	**Course Title:**	Biopharmaceutics				
2	**Course Code & Number:**	**PHA355**				
3	**Credit hours:**	C.H				TOTAL
		Th.	Seminar	practical	Training.	
		2				2
4	**Study level/ semester at which this course is offered:**	**3rd year / 2nd semester**				
5	**Pre –requisite (if any):**	Pharmaceutics (3)				
6	**Co –requisite (if any):**	**none**				
7	**Program (s) in which the course is offered:**	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	**Language of teaching the course:**	**English / Arabic**				
9	**Study System**	**Semester**				
10	**Mode of delivery:**	**Regular**				
11	**Location of teaching the course:**	**Al-Saeed University campus**				
12	**Prepared By:**	**Dr. Abdulkarim Kassem Alzomor**				

II. Course Description:

This course covers routes of drug administration, the mechanism of drug absorption, distributions, metabolism and excretion and the different factors which effect in these processes. The course covers Bioavailability, Bioequivalence, the importance of bioequivalence study and the protocols for designed bioequivalence study. Also cover drugs discovery and development phases.

III. Course Objectives:

This course aims to:

1. Study the factors affecting drug absorption including physiological factors and factors related to physiochemical properties.
2. Understand the factors affecting drug distribution, metabolism and excretion.
3. know the different methods for evaluation the drug in vivo and in vitro.

IV. Course Intended learning outcomes (CILOs) of the course		WRITE Symbol and number o PILOs
a.1	Identify the biologic, physiologic, and pathologic factors, which influence drugs' absorption, disposition and response in the body.	**A2, A3**

a.2	Explain how physical and chemical drugs' properties, dosage form and route of administration can influence drug performance in the body	**A2, A3**
b.1	Predict the mechanism for drugs metabolism, excretion and drug accumulation in the body and cause toxic effect.	**B1**
b.2	Select suitable route for drugs administration to enhance its effect in the body.	**B2, B3**
c.1	Perform in vivo and in vitro quality tests for drugs and evaluate the results.	**C1**
d.1	Develop his skills in the field of biopharmaceutics and manage time effectively	**D1**
d.2	Perform tasks and costs of the course independently and be able to work as an effective member in a team.	**D1**

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1. Identify the biologic, physiologic, and pathologic factors, which influence drugs' absorption, disposition and response in the body.	Lectures and Exercises.	Quizzes, Written exam.
a2. Explain how physical and chemical drugs' properties, dosage form and route of administration can influence drug performance in the body.		

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1. Predict the mechanism for drugs metabolism, excretion and drug accumulation in the body and cause toxic effect.	- Lectures, Discussions and Exercises. - Brain Storming.	Quizzes, Homework
b2. Select suitable route for drugs administration to enhance its effect in the body.		

(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1 Perform in vivo and in vitro quality tests for drugs and evaluate the results.	- Lectures, Exercises. - Simulation	Report, Solve problems

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1. Develop his skills in the field of biopharmaceutics and manage time effectively.	- Group discussions - Self-learning - Cooperative learning	Homework
d2. Perform tasks and costs of the course independently and be able to work as an effective member in a team.		

V. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	contact hours
1	Routes of Drug Administration	a1, a2, b1, d2	• Definition and importance of drug administration. • Types of route administration • Advantage and disadvantage for different routes.	1	2
2	Introduction to Biopharmaceutics	a1, a2, b1, d1, d2	• Definition of some terms used in biopharmaceutics • Aims of studying of biopharmaceutics • Plasma –time level curve and drug parameters. • Bioavailability, Advantages and Disadvantages	1	2
3	GIT drug absorption	a2, a2, b1, d1, d2	• Definition • Mechanism of drug absorption • Physiological factors affecting oral absorption	3	6

			• Physical-Chemical factors affecting oral absorption • Formulation factors affecting oral absorption • Techniques for the GIT absorption assessment		

4	Biopharmaceutics study of drug distribution	a2, a2, b1, d1, d2	• Definitions
			• Volume of distribution
			• Drug distribution to special tissue
			  ○ Brain
			  ○ Placenta
			• Factors affecting drug distribution
			• Binding to plasma proteins
			• Factors affecting protein binding
			• Drug interaction in protein binding
				2	4

5			Mid-term Exam	1	2
6	Biopharmaceutics study of drug metabolism	a2, a2, b1,b2,c1, d1, d2	• Definitions • Role of drug metabolism • Drug metabolism sites • Metabolic pathway • Metabolism enzymes • Metabolism phases • Factors affecting drug metabolism • Drug interaction in metabolism • Extrahepatic metabolism • Prodrugs	2	4

7	Biopharmaceutics study of Drug excretion	a2, a2, b1,b2, c1, d1, d2	• Definitions
			• Role and pathway of excretion
			• Types of excretion
			  ○ Renal excretion
			• Non-renal excretion
			  ▪ Biliary excretion
			  ▪ Mammary excretion
			  ▪ Salivary excretion
			  ▪ Skin
				2	4

			excretion ▪ Pulmonary excretion ▪ GIT excretion ▪ Genital excretion • Factors Affecting Renal Excretion • Clearance • Drug interaction		
8	Bioavailability and bioequivalence	a1,a2 c1, , d1, d2	• Historical aspects. • Definitions. • Objectives and significance of BA/BE studies. • Factors affecting Bioavailability. • Measurement of Bioavailability. • Methods for enhancing Bioavailability. • Introduction to Bioequivalence. • Limitations of BA/BE studies • Protocol design of bioavailability assessment. • Methods of bioequivalence determination	2	4
9	Drugs discovery and development	a1,a2,b1, c1, d1, d2	• Pre-phase • Phase I • Phase II • Phase III • Phase IV	1	2
11	FINAL - EXAM			1	2
Number of Weeks /and Units Per Semester				**16**	**32**

VI. Teaching strategies of the course:

- Lectures and Groups discussion.
- Training
- solving Problem
- Dialogue and discussion
- Brain Storming
- Simulation
- Cooperative learning
- Self – learning

VII. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Participation and solve problems	a1, a2, c1, d1, d2.	weekly	5
2	Exercises and home work	a1, b1, b2, c1, d1, d2	weekly	5

VIII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Assignments	1-14	10	%10	a1, a2, b1, b2, c1, d1, d2
2	Mid-semester exam of theoretical part (written exam	8	20	20%	a1, a2, c1, b1
3	Final exam of theoretical part (written exam)	16	70	70%	a1, a2, b1, b2, c1, d1, d2
Total			100	100%	

IX. Learning Resources:

1- Required Textbook(s) (maximum two).

1. Curtis L . Smith, Pharm.D., FCCP, BCPS (2018). Pharmacokinetics , Ferris State University Lansing, Michigan.
2. Leon Shargel Andrew (2012). Applied Biopharmaceuticsand Pharmacokinetics, Sixth edition, Lippincotts and William, Philadelphia

2- Essential References.

1. Michel E. Winter (2011). Basic clinical pharmacokinetics, Fifth edition, Lippincotts and

William, San Fransisco. 2. V. Venkateswarlu 2008) .Biopharmaceutics and Pharmacokinetics, PharmaMed Press ISBN: ·81-88449-51-2.
3- Electronic Materials and Web Sites *etc.*
1. www.boomer.org

	X. Course Policies:
1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects**: - Assignments and projects will be assessed individually unless the teacher request for group work
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the faculty rules.
7	**Other policies**: -

Template for Course Plan (Syllabus) of Biopharmaceutics

I. Information about Faculty Member Responsible for the Course:

		Office Hours					
Name of Faculty Member							
Location& Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Identification and General Information:

1	Course Title:	Biopharmaceutics				
2	Course Code & Number:	PHA355				
3	Credit hours:	C.H				TOTAL
		Th.	Seminar	practical	Training.	
		2				2
4	Study level/ semester at which this course is offered:	3rd / 2nd semester				
5	Pre –requisite (if any):	Pharmaceutics (3)				
6	Co –requisite (if any):	None				
7	Program (s) in which the course is offered:	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	Language of teaching the course:	English / Arabic				
9	Study System	Semester				
10	Mode of delivery:	Regular				
11	Location of teaching the course:	Al-Saeed University campus				

III. Course Description:

This course covers routes of drug administration, the mechanism of drug absorption, distributions, metabolism and excretion and the different factors which effect in these processes. The course covers Bioavailability, Bioequivalence, the importance of bioequivalence study and the protocols for designed bioequivalence study. Also cover drugs discovery and development phases.

IV. Course Objectives:

This course aims to:
1. Study the factors affecting drug absorption including physiological factors and factors related to physiochemical properties.
2. Understand the factors affecting drug distribution, metabolism and excretion.
3- know the different methods for evaluation the drug in vivo and in vitro.

V. Intended learning outcomes (ILOs) of the course:

1. Identify the biologic, physiologic, and pathologic factors, which influence drugs' absorption, dispo ant response in the body.
2. Explain how physical and chemical drugs' properties, dosage form and route of administration can influence drug performance in the body
3. Predict the mechanism for drugs metabolism, excretion and drug accumulation in the body and cause toxic effect.
4. Select suitable route for drugs administration to enhance its effect in the body.
5. Perform in vivo and in vitro quality tests for drugs and evaluate the results.
6. Develop his skills in the field of biopharmaceutics and manage time effectively
7. Perform tasks and costs of the course independently and be able to work as an effective member in a team

VI. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Sub Topics List	Week Due	contact hours
1	Routes of Drug Administration	• Definition and importance of drug administration. • Types of route administration • Advantage and disadvantage for different routes.	1st week	2
2	Introduction to Biopharmaceutics	• Definition of some terms used in biopharmaceutics • Aims of studying of biopharmaceutics • Plasma –time level curve and drug parameters. • Bioavailability, Advantages and Disadvantages	2nd week	2

3	GIT drug absorption	• Definition • Mechanism of drug absorption • Physiological factors affecting oral absorption	3rd week	6
		• Physical-Chemical factors affecting oral absorption • Formulation factors affecting oral	4th week	
		• Absorption • Techniques for the GIT absorption assessment	5th week	
4	Biopharmaceutics study of drug distribution	• Definitions • Volume of distribution • Drug distribution to special tissue ○ Brain ○ Placenta	6th week	4
		• Factors affecting drug distribution • Binding to plasma proteins • Factors affecting protein binding • Drug interaction in protein binding	7th week	
5	Mid-term Exam		8th week	2
6	Biopharmaceutics study of drug metabolism	• Definitions • Role of drug metabolism • Drug metabolism sites • Metabolic pathway • Metabolism enzymes • Metabolism phases • Factors affecting drug metabolism	9th week	4
		• Drug interaction in metabolism • Extrahepatic metabolism • Prodrugs	10th week	
7	Biopharmaceutics study of Drug excretion	• Definitions • Role and pathway of excretion • Types of excretion ○ Renal excretion	11th week	4
		○ Non-renal excretion ○ Biliary excretion Mammary excretion Salivary excretion	12th week	

		Skin excretion Pulmonary excretion GIT excretion Genital excretion • Factors Affecting Renal Excretion • Clearance • Drug interaction		
8	Bioavailability and bioequivalence	• Historical aspects. • Definitions. • Objectives and significance of BA/BE studies. • Factors affecting Bioavailability. • Measurement of Bioavailability. • Methods for enhancing Bioavailability. • Introduction to Bioequivalence. • Limitations of BA/BE studies	13th week	4
		• Protocol design of bioavailability assessment. • Methods of bioequivalence determination	14th week	
9	Drugs discovery and development	• Pre-phase • Phase I • Phase II • Phase III • Phase IV	15th week	2
11	FINAL - EXAM		16th week	2
Number of Weeks /and Units Per Semester			**16**	**32**

VII. Teaching strategies of the course:

- Lectures and Groups discussion.
- Training
- solving Problem
- Dialogue and discussion
- Brain Storming
- Simulation
- Cooperative learning
- Self – learning

VIII. Assignments:

No	Assignments	Week Due	Mark
1	Participation and solve problems	weekly	5
2	Exercises and home work	weekly	5

IX. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment
1	Assignments	1-14	10	10%
2	Mid-semester exam of theoretical part (written exam)	8	20	20%
3	Final exam of theoretical part (written exam)	16	70	70%
Total			100	100%

X. Learning Resources:

1- Required Textbook(s) (maximum two).

1. Curtis L. Smith, Pharm.D., FCCP, BCPS (2018). Pharmacokinetics, Ferris State University Lansing, Michigan.
2. Leon Shargel Andrew (2012). Applied Biopharmaceuticsand Pharmacokinetics, Sixth edition, Lippincotts and William, Philadelphia

2- Essential References.

1. Michel E. Winter (2011). Basic clinical pharmacokinetics, Fifth edition, Lippincotts and William, San Fransisco.
2. V. Venkateswarlu 2008) .Biopharmaceutics and Pharmacokinetics, PharmaMed Press ISBN: ·81-88449-51-2.

3- Electronic Materials and Web Sites *etc.*

1. www.boomer.org

XI. Course Policies:

1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam.
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.

3	**Exam Attendance/Punctuality:** **-** any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** - Assignments and projects will be assessed individually unless the teacher request for group work.
5	**Cheating**: **-** Cheating by any means will cause the student failure and he/she must re-study the course.
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:**

Course Specification of Cosmetics

I. Course Identification and General Information:

1	**Course Title:**	**Cosmetics**				
2	**Course Code & Number:**	**PHA356**				
3	**Credit hours:**	C.H				Total
		Th.	Seminar	Pr.	Tr.	
		2	-	-	-	2
4	**Study level/ semester at which this course is offered:**	3th level – 2nd semester				
5	**Pre –requisite (if any):**	**Pharmaceutics (3)**				
6	**Co –requisite (if any):**	NA				
8	**Program (s) in which the course is offered:**	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
9	**Language of teaching the course:**	English				
10	**Location of teaching the course:**	Al-Saeed University Campus				
11	**Prepared By:**	Bassam Al-Shaibani				

II. Course Description:

This course introduces introduction, history of cosmetics and different classifications. It includes the most common cosmetics used in the market as lipsticks, shampoos, hair colorants, creams …ect. It gives definition, ideal properties, classification and formulation for each class. Also all the additives used in cosmetics with examples available and the quality control tests for evaluation are discussed in this course.

III. Intended learning outcomes (ILOs)

	Program Intended learning outcomes (PILOs). After the completion of the program successfully, student will be able to:		**Course Intended learning outcomes (CILOs). After the completion of the course successfully, student will be able to:**
A2.	Demonstrate the essential knowledge of techniques and the key stages in drug and biopharmaceuticals discovery, development, manufacturing; and	a1.	Identify the history, classifications, components, formulation methods with different in vitro evaluation tests of different cosmetic formulations.

	controlling and ensuring their quality.		
A3.	Explain competently the pharmacological effects, therapeutic efficacy and safety of pharmaceutical and related products.	a2.	Define accurately the different functions of various cosmetic formulations and uses related.
B2.	Relate the scientific disciplines used in each stage of drug discovery, development, manufacturing, quality control and quality assurance of natural and synthetic medicines and biopharmaceuticals.	b1.	Design the formulation components and procedure techniques involved in formulation and manufacturing of different cosmetic products.
B3.	Practice thinking skills in designing pharmaceutical plans to optimize medication use and reduce the possibility of medication errors, and in solving problems related to pharmaceutical preparations and other related sciences.	b2.	Compare the physicochemical properties and evaluation methods between different cosmetic products.
C1.	Apply professional skills and techniques in each stage of drug and pharmaceuticals discovery from their various sources, development, manufacturing, controlling their quality, and in other related sciences, taking into account the professional standards and principles.	c1.	Demonstrate the different steps of cosmetic manufacturing processes and quality tests of different cosmetic products until used safely.
D2.	Develop his/her scientific and professional capabilities, especially in the field of pharmaceutical practice, and continues his/her graduate studies and continuous learning to enhance professional competence.	d1.	Estimate the effective good manufacturing practice and information resources in manufacturing, marketing and distribution of cosmetic products.

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1. Identify the history, classifications, components, formulation methods with different in vitro evaluation tests of different cosmetic formulations.	Interactive lecture, Demonstration, Presentation, Cooperative Learning,	Examination, Student Presentation,
a2. Define accurately the different functions of various cosmetic formulations and uses related.	Interactive lecture, Discussion, Presentation,	Examination, Student Presentation, Portfolios

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	**Teaching strategies**	**Assessment Strategies**
b1. Design the formulation components and procedure techniques involved in formulation and manufacturing of different cosmetic products.	Interactive lecture, Cooperative Learning, Practical Work,	Examination, Reports, Portfolios
b2. Compare the physicochemical properties and evaluation methods between different cosmetic products.	Discussion, Demonstration, Cooperative Learning,	Examination, Reports,

(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	**Teaching strategies**	**Assessment Strategies**
c1. Demonstrate the different steps of cosmetic manufacturing processes and quality tests of different cosmetic products until used safely.	Interactive lecture, Discussion, Presentation, Practical Work,	Examination, Practical Work,

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	**Teaching strategies**	**Assessment Strategies**
d1. Apply the effective good manufacturing practice and information resources in manufacturing, marketing and distribution of cosmetic products.	Interactive lecture, Discussion, Cooperative Learning, Presentation,	Student Presentation, Reports,

IV. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Week	Contact Hours
1	Introduction to cosmetics	a1, a2, d1,	Definitions, history, functions and uses, classifications and components of cosmetics.	2	4

2	Lipsticks	a1, b1, b2, c1,	Definition, ideal characteristics, formulation of lipsticks and examples, advantages and disadvantages of each component and evaluation methods of lipsticks.	2	4
3	Shampoos	a1, b1, b2, c1,	Definition, ideal properties, types of shampoos, formulation of shampoos and examples, advantages and disadvantages of each component and evaluation tests.	2	4
4	Medium exam	a1, a2, b1, c1, d1,		1	2
5	Toothpastes	a1, a2, b1, b2, c1,	Definition, general requirements of ideal dentifrices, formulation of toothpastes, advantages and disadvantages of each component and evaluation methods of shampoos.	2	4
6	Cosmetic creams	a1, b1, c1, d1,	Definition, classifications of creams and their properties with examples for each type, formulation of creams, advantages and disadvantages of each component and evaluation methods of creams.	2	4
7	Hair colourants	a1, a2, b1, b2, c1,	Introduction, definition, parameters, classification of hair colourants, composition of each class of creams and evaluation methods or tests.	2	4
8	Nail lacquers	a1, b1, b2, c1,	Definition, ideal properties, formulation of nail lacquers and examples, advantages and disadvantages of each additive and evaluation tests.	1	2
9	Cosmetic powders	a1, b1, c1,	Definition, characteristics, classifications of cosmetic powders with properties, formulation of powders and quality control tests.	1	2
10	Final exam	a1, a2, b1, c1, d1,		1	2
Number of Weeks /and Units Per Semester				**16**	**32**

B - Practical Aspect: (if any)
NA

V. Teaching strategies of the course:
Interactive lecture.
Interactive class discussion.
Presentations.

VI. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark	Proportion of Final Assessment
1	Midterm	a1, b1, b2. c1, d1,	6th	30	30%
2	Attendance	c1, c2, d1,	15th	10	10%
3	Final exam	a1, a2, b1, c1, d1,	16th	60	60%
	Total		16	100	100%

VII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Written exam	6th	30	30%	c1, c2, d1,

VIII. Learning Resources:	
Written in the following order: (Author - Year of publication – Title – Edition – Place of publication – Publisher).	
1- Required Textbook(s) (maximum two).	
	1. Gaurav Kumar Sharma, Jayesh Gadhiya, (2018), Textbook of Cosmetic Formulations, electronic press, India.
2- Essential References.	
	1. Hilda Butler,(2000),Poucher's Perfumes, Cosmetics and Soaps,10th edition, Chapman & Hall, US 2. Ernest W. Flick, (1992), Cosmetic and Toiletry Formulations, 2nd edition, volume 2, Noyes Publications, USA. 3. Zoe Diana, Lauren A., (2006), Cosmetic Formulation of Skin Care Products, Taylor & Francis Group, USA.
3- Electronic Materials and Web Sites *etc*.	
	- Textbook of Cosmetic Formulations (https://www.researchgate.net/publication/325023106).

IX. Course Policies:	
Based on university regulations, the following aspects should be figured out:	
1	**Class Attendance:** - Attendance is mandatory for all students for credit to be received and will be monitored. - The student is excluded from class if absence percentage exceeds 15% with no excuse or 25% with an accepted excuse.
2	**Tardy:** - Attendance will be taken every lecture at the first 20 minutes. - Students are considered absent if they are 20 minutes or more late to a single class period. - Students arriving to class after the first 20 minutes will be counted tardy. - The percentage of students' unexcused retard should not exceed three lectures. Otherwise, they will be counted absent.
3	**Exam Attendance/Punctuality:** - All students registered for the course are required to attend the assigned exams. - Dates and locations will be posted prior to the examination date. No re-sit exams are carried out for in-course examinations. - If the student misses an in-course examination and his/her excuse was accepted, the missed exam grade will be calculated from the final exam grade.

	- If a student misses the final exam, and unless he/she provides an accepted excuse, a grade of F will be granted. - If the excuse was accepted, a student may take the exam as first attempt in the second attempt examinations.
4	**Assignments & Projects:** - All assignments must be submitted on or before their due time. Late submission will not be accepted. Otherwise, 2% of the obtained marks will be subtracted for each late day, including weekends and holidays. - Projects must be submitted on or before the dead-lines.
5	**Cheating**: - Cheating in examinations or tests may take the form of copying from another student or bringing unauthorized materials into the exam room (e.g., crib notes, pages or cell phones). - Exam cheating can also include exam impersonation. - A student found guilty of contributing to cheating in examinations or term assignments is also subject to serious academic penalty. Please refer to the academic regulations of AlRowad university for further details.
6	**Plagiarism**: - "To plagiarize is to take ideas or words of another person and pass them off as one's own". - Plagiarism or any other form of cheating in examinations, term tests or academic work is subject to serious academic penalty (e.g. suspension or expulsion from the faculty or university)
7	**Other policies:** - Cell phones / IPod /PC, and other communication or entertainment devices must be turned off during theory classes and laboratory classes. - Students should familiarize themselves with all university, college, and department policies, rules, and code of conduct.

Course Plan (Syllabus) of Cosmetics

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member	Dr. Bassam Alshaibani	Office Hours (…… hours weekly)					
Location& Telephone No.	777443417	SAT	SUN	MON	TUE	WED	THU
E-mail	bassam00001@yahoo.com						

II. Course Identification and General Information:						
1	Course Title:	Cosmetics				
2	Course Code & Number:					
3	Credit hours:	C.H				TOTAL
		Th.	Seminar	Pr.	Tr.	
		2	-	-	-	2
4	Study level/ semester at which this course is offered:	4th Level –2st Semester				
5	Pre –requisite (if any):	Pharmaceutics (3)				
6	Co –requisite (if any):	NA				
7	Program (s) in which the course is offered:	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	Language of teaching the course:	English				
9	Study System	Semester-based				
10	Mode of delivery:	Regular				
11	Location of teaching the course:	Al-Saeed university campus				
12	Prepared By:	Dr. Bassam Alshaibani				

III. Course Description:

This course introduces introduction, history of cosmetics and different classifications. It includes the most common cosmetics used in the market as lipsticks, shampoos, hair colorants, creams …ect. It gives definition, ideal properties, classification and formulation for each class. Also all the additives used in cosmetics with examples available and the quality control tests for evaluation are discussed in this course.

IV. Intended learning outcomes (ILOs)			
	Program Intended learning outcomes (PILOs). **After the completion of the program successfully, student will be able to:**		**Course Intended learning outcomes (CILOs).** **After the completion of the course successfully, student will be able to:**
A2.	Demonstrate the essential knowledge of techniques and the key stages in drug and biopharmaceuticals discovery, development, manufacturing; and controlling and ensuring their quality.	a1.	Identify the history, classifications, components, formulation methods with different in vitro evaluation tests of different cosmetic formulations.
A3.	Explain competently the pharmacological effects, therapeutic efficacy and safety of pharmaceutical and related products.	a2.	Define accurately the different functions of various cosmetic formulations and uses related.
B2.	Relate the scientific disciplines used in each stage of drug discovery, development, manufacturing, quality control and quality assurance of natural and synthetic medicines and biopharmaceuticals.	b1.	Design the formulation components and procedure techniques involved in formulation and manufacturing of different cosmetic products.
B3.	Practice thinking skills in designing pharmaceutical plans to optimize medication use and reduce the possibility of medication errors, and in solving problems related to pharmaceutical preparations and other related sciences.	b2.	Compare the physicochemical properties and evaluation methods between different cosmetic products.
C1.	Apply professional skills and techniques in each stage of drug and pharmaceuticals discovery from their various sources, development, manufacturing, controlling their quality, and in other related sciences, taking into account the professional standards and principles.	c1.	Demonstrate the different steps of cosmetic manufacturing processes and quality tests of different cosmetic products until used safely.
D2.	Develop his/her scientific and professional capabilities, especially in the field of pharmaceutical practice, and continues his/her graduate studies and continuous learning to enhance professional competence.	d1.	Estimate the effective good manufacturing practice and information resources in manufacturing, marketing and distribution of cosmetic products.

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	**Teaching strategies**	**Assessment Strategies**
a1. Identify the history, classifications, components, formulation methods with different in vitro evaluation tests of different cosmetic formulations.	Interactive lecture, Demonstration, Presentation, Cooperative Learning,	Examination, Student Presentation,
a2. Define accurately the different functions of various cosmetic formulations and uses related.	Interactive lecture, Discussion, Presentation,	Examination, Student Presentation, Portfolios

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	**Teaching strategies**	**Assessment Strategies**
b1. Design the formulation components and procedure techniques involved in formulation and manufacturing of different cosmetic products.	Interactive lecture, Cooperative Learning, Practical Work,	Examination, Reports, Portfolios
b2. Compare the physicochemical properties and evaluation methods between different cosmetic products.	Discussion, Demonstration, Cooperative Learning,	Examination, Reports,

(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	**Teaching strategies**	**Assessment Strategies**
c1. Demonstrate the different steps of cosmetic manufacturing processes and quality tests of different cosmetic products until used safely.	Interactive lecture, Discussion, Presentation, Practical Work,	Examination, Practical Work,

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	**Teaching strategies**	**Assessment Strategies**
d1. Apply the effective good manufacturing practice and information resources in	Interactive lecture, Discussion, Cooperative	Student Presentation, Reports,

manufacturing, marketing and distribution of cosmetic products.	Learning, Presentation,	

V. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Week	Contact Hours
1	Introduction to cosmetics	a1, a2, d1,	Definitions, history, functions and uses, classifications and components of cosmetics.	2	4
2	Lipsticks	a1, b1, b2, c1,	Definition, ideal characteristics, formulation of lipsticks and examples, advantages and disadvantages of each component and evaluation methods of lipsticks.	2	4
3	Shampoos	a1, b1, b2, c1,	Definition, ideal properties, types of shampoos, formulation of shampoos and examples, advantages and disadvantages of each component and evaluation tests.	2	4
4	Medium exam	a1, a2, b1, c1, d1,		1	2
5	Toothpastes	a1, a2, b1, b2, c1,	Definition, general requirements of ideal dentifrices, formulation of toothpastes, advantages and disadvantages of each component and evaluation methods of shampoos.	2	4
6	Cosmetic creams	a1, b1, c1, d1,	Definition, classifications of creams and their properties with examples for each type, formulation of creams, advantages and disadvantages of each component and evaluation methods of creams.	2	4
7	Hair colourants	a1, a2, b1, b2, c1,	Introduction, definition, parameters, classification of hair colourants, composition of each class of creams and evaluation methods or tests.	2	4
8	Nail lacquers	a1, b1, b2, c1,	Definition, ideal properties, formulation of nail lacquers and examples, advantages and disadvantages of each additive and evaluation tests.	1	2

9	Cosmetic powders	a1, b1, c1,	Definition, characteristics, classifications of cosmetic powders with properties, formulation of powders and quality control tests.	1	2
10	Final exam	a1, a2, b1, c1, d1,		1	2
Number of Weeks /and Units Per Semester				**16**	**32**

VI. Teaching strategies of the course:
Interactive lecture.
Interactive class discussion.
Presentations.

VII. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark	Proportion of Final Assessment
1	Midterm	a1, b1, b2. c1, d1,	6th	30	30%
2	Attendance	c1, c2, d1,	15th	10	10%
3	Final exam	a1, a2, b1, c1, d1,	16th	60	60%
	Total		16	100	100%

VIII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Written exam	6th	30	30%	c1, c2, d1,

IX. Learning Resources:
Written in the following order: (Author - Year of publication – Title – Edition – Place of publication – Publisher).
1- Required Textbook(s) (maximum two).
2. Gaurav Kumar Sharma, Jayesh Gadhiya, (2018), Textbook of Cosmetic Formulations, electronic press, India.
2- Essential References.
4. Hilda Butler,(2000),Poucher's Perfumes, Cosmetics and Soaps,10th edition, Chapman & Hall, USA. 5. Ernest W. Flick, (1992), Cosmetic and Toiletry Formulations, 2nd edition, volume 2, Noyes Publications, USA. 6. Zoe Diana, Lauren A., (2006), Cosmetic Formulation of Skin Care Products, Taylor & Francis G USA.
3- Electronic Materials and Web Sites *etc*.
- Textbook of Cosmetic Formulations (https://www.researchgate.net/publication/325023106).

X. Course Policies:	
Based on university regulations, the following aspects should be figured out:	
1	**Class Attendance:** - Attendance is mandatory for all students for credit to be received and will be monitored. - The student is excluded from class if absence percentage exceeds 15% with no excuse or 25% with an accepted excuse.
2	**Tardy:** - Attendance will be taken every lecture at the first 20 minutes. - Students are considered absent if they are 20 minutes or more late to a single class period. - Students arriving to class after the first 20 minutes will be counted tardy. - The percentage of students' unexcused retard should not exceed three lectures. Otherwise, they will be counted absent.
3	**Exam Attendance/Punctuality:** - All students registered for the course are required to attend the assigned exams. - Dates and locations will be posted prior to the examination date. No re-sit exams are carried out for in-course examinations. - If the student misses an in-course examination and his/her excuse was accepted, the missed exam grade will be calculated from the final exam grade.

	- If a student misses the final exam, and unless he/she provides an accepted excuse, a grade of F will be granted. - If the excuse was accepted, a student may take the exam as first attempt in the second attempt examinations.
4	**Assignments & Projects:** - All assignments must be submitted on or before their due time. Late submission will not be accepted. Otherwise, 2% of the obtained marks will be subtracted for each late day, including weekends and holidays. - Projects must be submitted on or before the dead-lines.
5	**Cheating**: - Cheating in examinations or tests may take the form of copying from another student or bringing unauthorized materials into the exam room (e.g., crib notes, pages or cell phones). - Exam cheating can also include exam impersonation. - A student found guilty of contributing to cheating in examinations or term assignments is also subject to serious academic penalty. Please refer to the academic regulations of AlRowad university for further details.
6	**Plagiarism**: - "To plagiarize is to take ideas or words of another person and pass them off as one's own". - Plagiarism or any other form of cheating in examinations, term tests or academic work is subject to serious academic penalty (e.g. suspension or expulsion from the faculty or university)
7	**Other policies:** - Cell phones / IPod /PC, and other communication or entertainment devices must be turned off during theory classes and laboratory classes. - Students should familiarize themselves with all university, college, and department policies, rules, and code of conduct.

Course Specification of pharmacology (2)

I. Course Identification and General Information:

1	**Course Title:**	**Pharmacology (2)**				
2	**Course Code & Number:**	**PHA362**				
3	**Credit hours:**	C.H				TOTAL
		Th.	Seminar	practical	Training.	
		2		**1**		**3**
4	**Study level/ semester at which this course is offered:**	Third level, second semester				
5	**Pre –requisite (if any):**	**Pharmacology (1)**				
6	**Co –requisite (if any):**					
7	**Program (s) in which the course is offered:**	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	**Language of teaching the course:**	English Language				
9	**Study System**	Semester				
10	**Mode of delivery:**	Regular				
11	**Location of teaching the course:**	University				
12	**Prepared By:**	**Dr. Hamad Mahmood Alshabi**				

II. Course Description:

This course covers the pharmacology of drugs acting on the cardiovascular, blood, renal, respiratory and gastrointestinal systems. This course includes drugs' mechanism of action, pharmacokinetics, clinically significant side effects & drug interactions, contraindications and clinical uses. This course also involves some pharmacological experiments.

III. Course Objectives:

1- Students should be able to mention accurately the actions and uses of the major classes of clinically important drugs.
2- Students should be able to explain the mechanisms by which drugs act on their target receptors and produce their therapeutic and toxic effects.
3- Students should be able to discuss professionally adverse effects and pharmacokinetics of individual drugs.

IV. Course Intended learning outcomes (CILOs) of the course: Upon successful completion of this course, the student should be able to:		WRITE Symbol and number of PILOs
a.1	Recognize the pathophysiology of major diseases affecting cardiovascular, blood, renal, respiratory and gastrointestinal systems.	**A1**
a.2	Identify the pharmacological properties (action, mechanisms of action, therapeutic uses, dosage, contraindications, ADRs and drug interactions of the drugs acting on the cardiovascular, blood, renal, respiratory and gastrointestinal systems.	**A3**
b.1	Differentiate between the major drug classes and between members of each drug class in relation to their mechanism of action, pharmacokinetic parameters and adverse effects.	**B1**
b.2	Select optimum therapeutic agents based on their binding sites, molecular mechanism of action and pharmacokinetic parameters.	**B3**
c.1	Apply the principles of experimental pharmacology to investigate drug actions of different pharmacological classes.	**C1**
c.2	Advise patients and other health professionals on proper use of medicines and their possible adverse effects.	**C2, C4**
d.1	Demonstrate critical thinking, decision making, team working and communication skills.	**D1**
d.2	Utilize different resources of pharmacology (books, professional sites and scientific journals) to get information about the drugs.	**D3**

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies

a1. Recognize the pathophysiology of major diseases affecting cardiovascular, blood, renal, respiratory and gastrointestinal systems.	- Interactive lectures - Groups discussion. - Case-Study - Assignments	- Written Exams (midterm and final) - Quizzes - Multiple Choice Questions (MCQs) - Assignments **&** Coursework Activities
a2- Identify the pharmacological properties (action, mechanisms of action, therapeutic uses, dosage, contraindications, ADRs and drug interactions of the drugs acting on the cardiovascular, blood, renal, respiratory and gastrointestinal systems.		

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	**Teaching strategies**	**Assessment Strategies**
b1. Differentiate between the major drug classes and between members of each drug class in relation to their mechanism of action, pharmacokinetic parameters and adverse effects.	- Interactive lectures - Groups discussion. - Problem-solving learning. - Assignments - Simulation	- Written Exams (midterm and final) - Quizzes - Multiple Choice Questions (MCQs) - Assignments **&** Coursework Activities - Problem-solving exercises.
b2. Select optimum therapeutic agents based on their binding sites, molecular mechanism of action and pharmacokinetic parameters.		

(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	**Teaching strategies**	**Assessment Strategies**
c1. Apply the principles of experimental pharmacology to investigate drug actions	- Practical classes - Simulated software programs.	- Practical Lab Assessments and reports

of different pharmacological classes.	- Problem-solving learning. - Case-Study	- Problem-solving exercises. - Coursework Activities
c2. Advise patients and other health professionals on proper use of medicines and their possible adverse effects.		

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	**Teaching strategies**	**Assessment Strategies**
d1. Demonstrate critical thinking, decision making, team working and communication skills.	- Practical classes. - Cooperative & Self – learning. - Problem-solving learning. - Assignments	- Oral Presentation - Assignments & Coursework Activities - Reports of Assignments - Problem Solving Exercise
d2. Utilize different resources of pharmacology (books, professional sites and scientific journals) to get information about the drugs.		

V. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	contact hours
1	**DRUGS ACTING ON CARDIOVASCULAR AND RENAL SYSTEMS**	a1, a2, b1, b2, c2, d1, d2	- Diuretics - Anti-hypertensive drugs. - Vasodilators & the Treatment of Angina Pectoris. - Drugs Used in Heart Failure. - Agents Used in Cardiac Arrhythmias.	**6**	**12**
2		a1, a2, b1, b2, c2	**Mid-term Exam**	**1**	**2**
3	**DRUGS USED TO TREAT DISEASES OF BLOOD**	a1, a2, b1, b2, c2, d1, d2	- Drugs Used in Disorders of Coagulation: anticoagulant, fibrinolytic and antiplatelet drugs. - Agents Used in Dyslipidemia. - Hematopoietic Agents: agents	**3**	**6**

			used in anemias and hematopoietic growth factors.		
4	**DRUGS ACTING ON RESPIRATORY SYSTEM**	a1, a2, b1, b2, c2, d1, d2	- Drugs used for cough (Anti-tussives, Expectorants and Mucolytic Agents). - Drugs used in asthma, chronic obstructive pulmonary disease (COPD) and other pulmonary diseases.	**2**	**4**
5	**DRUGS USED IN THE TREATMENT OF GIT DISEASES**	a1, a2, b1, b2, c2, d1, d2	- Drugs used in acid-peptic diseases. - Drugs stimulating gastrointestinal motility. - Laxatives. - Antidiarrheal agents. - Drugs used in the treatment of irritable bowel syndrome. - Antiemetic agents. - Drugs used to treat inflammatory bowel disease, bile acid therapy for gallstones, and drugs used to treat variceal hemorrhage.	**3**	**6**
		a1, a2, b1, b2, c2	**Final Term exam**	**1**	**2**
Number of Weeks /and Units Per Semester				**16**	**32**

B - Practical Aspect:

Order	Tasks/ Experiments	Number of Weeks	contact hours	Learning Outcomes
1	Electrocardiogram	1	2	a1, c1, c2, d1-d2
2	Heart sounds and Lung volumes	1	2	c1, d1-d2
3	Drugs acting on rat cardiovascular system	1	2	b1, c1, d1-d2
4	Isolated perfused heart	1	2	b1, c1, d1-d2
5	Studying the dose response relationship using the diuretic effect of furosemide	2	4	b1, c1, d1-d2
6	Effect of smoking on the cardiovascular system	1	2	c1, d1-d2
7	Effects of drugs on BP and H.R using Cardiolab (simulation program)	1	2	b1, c1, d1-d2

8	Effects of drugs on BP and H.R using Cardiolab (simulation program)	**1**	**2**	b1, c1, d1-d2
9	Effects of drugs on BP and H.R using Cardiolab (simulation program)	**1**	**2**	b1, c1, d1-d2
10	To study the convulsant effects of strychnine and picrotoxin in frogs and to determine the site of action.	**1**	**2**	b1, c1, d1-d2
11	To identify the unknown (convulsant) drug and determine its site of action.	**1**	**2**	b1, c1, d1-d2
12	Case studies	**1**	**2**	b2, c2, d1-d2
13	**Practical Exam**	**1**	**2**	b1, c1, d1-d2
Number of Weeks /and Units Per Semester		**14**	**28**	

VI. Teaching strategies of the course:

- Interactive lectures
- Groups discussion.
- Case-Study
- Assignments
- Problem-solving learning.
- Simulation
- Practical classes
- Simulated software programs.
- Cooperative & Self – learning.

VII. Assignments:

No	Assignments	Aligned CILOs (symbols)	Week Due	Mark
1	Participation, Homework Assignments	**a1, a2, b1, b2, d1, d2**	Weekly	3
2	Exercises, Reports	**b1, b2, c2, d1, d2**	Weekly	3
3		**Total**		6

VIII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Assignments	1-14	6	6%	**a1, a2, b1, b2, d1, d2**

2	Quizzes 1	6	2	2%	a1, a2, b1, b2
3	Mid-term exam of theoretical part (written exam)	7	10	10%	a1, a2, b1, b2, c2
4	Quizzes 2	12	2	2%	a1, a2, b1, b52
5	Practical lab work	1-12	10	10%	b1, c1, d1-d2
6	Final exam (practical)	14	30	30%	b1, c1, d1-d2
7	Final exam of theoretical part (written exam)	16	40	40%	a1, a2, b1, b2, c2
	Total		100	100%	

IX. Learning Resources:

1- Required Textbook(s) (maximum two).

1- Katzung, B.G., (2018). Basic & Clinical Pharmacology, 14th edition, the Mc Grow Hill Companies.
2- Lippincott's illustrated reviews, 2019, Pharmacology, 7th edition, Wolters Kluwer.

2- Essential References.

1- James M. Ritter , Rod J. Flower, 2020, Rang and Dale Pharmacology. 9th edition, Churchill Livingstone Elsevier.
2- **Laurence L. Brunton,** 2018. Goodman and Gillman's Pharmacological Basis of Therapeutics: 13th edition, McGraw-Hill Education.

3- Electronic Materials and Web Sites *etc*.

1- Website: Pharmacology Animation Book, http://animationbook.net
2- www.pharmacology2000.com/learning2.htm
3- www.pharmacology.com

X. Course Policies:

1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.

4	**Assignments & Projects**: - Assignments and projects will be assessed individually unless the teacher request for group work
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the faculty rules.
7	**Other policies**: -

Template for Course Plan (Syllabus) of Pharmacology (2)

I. - Information about Faculty Member Responsible for the Course:

		Office Hours					
Name of Faculty Member							
Location& Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Identification and General Information:

1	Course Title:	Pharmacology (2)				
2	Course Code & Number:	PHA362				
3	Credit hours:	C.H				TOTAL
		Th.	Seminar	practical	Training.	
		2		1		3
4	Study level/ semester at which this course is offered:	Third level, second semester				
5	Pre –requisite (if any):	Pharmacology (1)				
6	Co –requisite (if any):					
7	Program (s) in which the course is offered:	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	Language of teaching the course:	English Language				
9	Study System	Semester				
10	Mode of delivery:	Regular				
11	Location of teaching the course:	University				

III. Course Description:

This course covers the pharmacology of drugs acting on the cardiovascular, blood, renal, respiratory and gastrointestinal systems. This course includes drugs' mechanism of action, pharmacokinetics, clinically significant side effects & drug interactions, contraindications and clinical uses. This course also involves some pharmacological experiments.

IV. Course Objectives:

1- Students should be able to mention accurately the actions and uses of the major classes of clinically important drugs.
2- Students should be able to explain the mechanisms by which drugs act on their target receptors and produce their therapeutic and toxic effects.
3- Students should be able to discuss professionally adverse effects and pharmacokinetics of individual drugs.

V. Intended learning outcomes (ILOs) of the course:

Upon successful completion of this course, the student should be able to:

1- Recognize the pathophysiology of major diseases affecting cardiovascular, blood, renal, respiratory and gastrointestinal systems.
2- Identify the pharmacological properties (action, mechanisms of action, therapeutic uses, dosage, contraindications, ADRs and drug interactions of the drugs acting on the cardiovascular, blood, renal, respiratory and gastrointestinal systems.
3- Differentiate between the major drug classes and between members of each drug class in relation to their mechanism of action, pharmacokinetic parameters and adverse effects.
4- Select optimum therapeutic agents based on their binding sites, molecular mechanism of action and pharmacokinetic parameters.
5- Apply the principles of experimental pharmacology to investigate drug actions of different pharmacological classes.
6- Advise patients and other health professionals on proper use of medicines and their possible adverse effects.
7- Demonstrate critical thinking, decision making, team working and communication skills.
8- Utilize different resources of pharmacology (books, professional sites and scientific journals) to get information about the drugs.

VI. Course Content:

A – Theoretical Aspect:

Order	Topics List	Week Due	Contact Hours
1	**DRUGS ACTING ON CARDIOVASCULAR AND RENAL SYSTEMS:**	W1	2

	1- Diuretics		
2	2- Anti-hypertensive drugs.	W2, W3	4
3	3- Vasodilators & the Treatment of Angina Pectoris.	W4	2
4	4- Drugs Used in Heart Failure.	W5	2
5	5- Agents Used in Cardiac Arrhythmias.	W6	2
6	**Mid-term Exam**	W7	2
7	**DRUGS USED TO TREAT DISEASES OF BLOOD:** **1-** Drugs Used in Disorders of Coagulation: anticoagulant, fibrinolytic and antiplatelet drugs.	W8	2
8	**2-** Agents Used in Dyslipidemia.	W9	2
9	**3-** Hematopoietic Agents: agents used in anemias and hematopoietic growth factors.	W10	2
10	**DRUGS ACTING ON RESPIRATORY SYSTEM:** - Drugs used for cough (Anti-tussives, Expectorants and Mucolytic Agents). - Drugs used in asthma, chronic obstructive pulmonary disease (COPD) and other pulmonary diseases.	W11, W12	4
11	**DRUGS USED IN THE TREATMENT OF GIT DISEASES:** **1-** Drugs used in acid-peptic diseases.	W13	2
12	**2-** Drugs stimulating gastrointestinal motility. - Laxatives. - Antidiarrheal agents. - Drugs used in the treatment of irritable bowel syndrome.	W14	2
13	**3-** Antiemetic agents. - Drugs used to treat inflammatory bowel disease, bile acid therapy for gallstones, and drugs used to treat variceal hemorrhage.	W15	2
14	**Final Term exam**	W16	2
Number of Weeks /and Units Per Semester		**16**	**32**

B – Practical Aspect:			
Order	**Topics List**	**Week Due**	**Contact Hours**
1	Electrocardiogram	W1	**2**
2	Heart sounds and Lung volumes	W2	**2**
3	Drugs acting on rat cardiovascular system	W3	**2**
4	Isolated perfused heart	W4	**2**
5	Studying the dose response relationship using the diuretic effect of furosemide	W5, W6	**4**
6	Effect of smoking on the cardiovascular system	W7	**2**
7	Effects of drugs on BP and H.R using Cardiolab (simulation program)	W8	**2**
8	Effects of drugs on BP and H.R using Cardiolab (simulation program)	W9	**2**
9	Effects of drugs on BP and H.R using Cardiolab (simulation program)	W10	**2**
10	To study the convulsant effects of strychnine and picrotoxin in frogs and to determine the site of action.	W11	**2**
11	To identify the unknown (convulsant) drug and determine its site of action.	W12	**2**
12	Case studies	W13	**2**
13	**FINAL PRACTICAL EXAM**	W14	**2**
Number of Weeks /and Units Per Semester		**14**	**28**

VII. Teaching strategies of the course:

- Interactive lectures
- Groups discussion.
- Case-Study
- Assignments
- Problem-solving learning.
- Simulation
- Practical classes
- Simulated software programs.
- Cooperative & Self – learning.

VIII. Assignments:

No	Assignments		Week Due	Mark
1	Participation, Homework Assignments		Weekly	3
2	Exercises, Reports		Weekly	3
3		**Total**		6

IX. Schedule of Assessment Tasks for Students During the Semester:

Assessment	Type of Assessment Tasks	Week Due	Mark	Proportion of Final Assessment
1	Assignments	1-14	6	6%
2	Quizzes 1	6	2	2%
3	Mid-term exam of theoretical part (written exam)	7	10	10%
4	Quizzes 2	12	2	2%
5	Practical lab work	1-12	10	10%
6	Final exam (practical)	14	30	30%
7	Final exam of theoretical part (written exam)	16	40	40%
8	**Total**		100	100%

X. Learning Resources:

1- Required Textbook(s) (maximum two).

1- Katzung, B.G., (2018). Basic & Clinical Pharmacology, 14th edition, the Mc Grow Hill Companies.
2- Lippincott's illustrated reviews, 2019, Pharmacology, 7th edition, Wolters Kluwer.

2- Essential References.

1- James M. Ritter , Rod J. Flower, 2020, Rang and Dale Pharmacology. 9th edition, Churchill Livingstone Elsevier.
2- **Laurence L. Brunton,** 2018. Goodman and Gillman's Pharmacological Basis of Therapeutics: 13th edition, McGraw-Hill Education.

3- Electronic Materials and Web Sites *etc.*

1- Website: Pharmacology Animation Book, http://animationbook.net

2- www.pharmacology2000.com/learning2.htm 3- www.pharmacology.com

XI.	Course Policies:
1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam.
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** - Assignments and projects will be assessed individually unless the teacher request for group work.
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course.
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:**

Course Specification of Phytochemistry (2)

I. Course Identification and General Information:

1	**Course Title:**	**Phytochemistry (2)**				
2	**Course Code & Number:**	**PHA375**				
3	**Credit hours:**	C.H				TOTAL
		Th.	Seminar	practical	Training.	
		2		1		***3***
4	**Study level/ semester at which this course is offered:**	**3rd year / 2nd semester**				
5	**Pre –requisite (if any):**	**Phytochemistry (1)**				
6	**Co –requisite (if any):**	**None**				
7	**Program (s) in which the course is offered:**	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	**Language of teaching the course:**	**English**				
9	**Study System**	**Semester**				
10	**Mode of delivery:**	**Regular**				
11	**Location of teaching the course:**	**University**				
12	**Prepared By:**	**Dr. Abdulrahman Roshan**				

II. Course Description:

This course focuses on the study of plants constituents (not included in Phytochemistry I) of crude drugs based on chemical classification (alkaloids, fats, volatile oils and resins) and marine natural products. The study includes methods of isolation, identification, qualitative and quantitative evaluation, medicinal uses, physical and chemical properties, biosynthetic pathway and chemical structure activity relationship. The students also will be able to apply knowledge in performing laboratory experiments.

III. Course Objectives:

The student will be able to

1- Gain valuable knowledge about the classification, chemistry and biological sources of alkaloids, fats, volatile oils and resins and marine natural products.

2- List the different methods and techniques used for isolation and characterization of alkaloids, fats, volatile oils and resins and marine natural products.

3- Draw and discuss the biosynthetic pathways of the studded compounds.

4- Describe the appropriate methods for their qualitative identification and quantitative estimation, and recognize their pharmaceutical importance.

IV. Course Intended learning outcomes (CILOs) of the course		WRITE Symbol and number of PILOs
a.1	Demonstrate the essential knowledge of extraction, isolation, purification, characterization, qualitative and quantitative determination of carbohydrates, glycosides, tannins, bitter principles and natural toxins as well as their pharmacological effects.	**A2, A3**
a.2	Recognize the biosynthetic pathway and draw the chemical structure of such biologically active compounds.	**A2, A3**
b.1	Design appropriate methods for isolation, purification, qualitative and quantitative determination of carbohydrates, glycosides, tannins and bitter principles as natural constituents.	**B2, B4**
b.2	Anticipate the physical, chemical and pharmacological properties of carbohydrates, glycosides, tannins, bitter principles and natural toxins.	**B1**
c.1	Use the chemical and physical methods for carbohydrates, glycosides and tannins extraction, isolation and purification from their natural origin.	**C1, C5**
c.2	Conduct the appropriate method for the carbohydrates, glycosides and tannins qualitative and quantitative determination according to GLP guidelines.	**C1, C5**
d.1	Demonstrate time management, independent and team working, decision making and life-long learning skills.	**D1, D2**
d.2	Carry out private study, including direct study on specific topics, independent study from textbooks.	**D3**

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1. Demonstrate the essential knowledge of extraction, isolation, purification, characterization, qualitative and quantitative determination of carbohydrates, glycosides, tannins, bitter principles and natural toxins as well as their pharmacological effects.	Lecture and group discussion	Participation, quizzes and written exam
a2. Recognize the biosynthetic pathway and draw the chemical structure of such biologically active compounds.		

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1. Design appropriate methods for isolation, purification, qualitative and quantitative determination of carbohydrates, glycosides, tannins and bitter principles as natural constituents.	Lecture, discussion and problem based learning, practical (lab) classes	Oral presentation, written and practical examination
b2. Anticipate the physical, chemical and pharmacological properties of carbohydrates, glycosides, tannins, bitter principles and natural toxins.		

(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1. Use the chemical and physical methods for carbohydrates, glycosides	Laboratory work	practical works, Practical reports and presentations based on their experimental

and tannins extraction, isolation and purification from their natural origin.		work
c2. Conduct the appropriate method for the carbohydrates, glycosides and tannins qualitative and quantitative determination according to GLP guidelines.		

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1. Demonstrate time management, independent and team working, decision making and life-long learning skills.	Practical class, assignment and discussion in groups Problem-based Learning	- Reports, presentations, - Problem Solving Exercise
d2. Carry out private study, including direct study on specific topics, independent study from textbooks.		

V. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	contact hours
1	Volatile oils	a1-a2, b2, c1, d1, d2	-Introduction and Preparation of volatile oils	1	2
	Terpenoids	a1-a2, b2, c1, d1, d2	Biosynthesis and classification of volatile oils. -Terpene hydrocarbons of volatile oils. -Oxygenated hydrocarbons of volatile oils.	3	6
2	Sulfur & nitrogen compounds of volatile oils.	a1-a2, b2, c1, d1, d2	Chemistry, biosynthesis, properties, identification, biological sources and medicinal uses	1	2
3	Resins and resin combination	a1-a2, b2, c1, d1, d2	-Chemical composition, biological sources and	1	2

			medicinal uses		
4	**Med- Term Exam**	a1-a2, b2, c1		1	2
5	Lipids (fixed oils, fats and waxes)	a1-a2, b2, c1, d1, d2	Definition, classification, chemistry, biosynthesis, properties, identification, biological sources and medicinal uses	1	2
6	Alkaloids	a1-a2, b2, c1, d1, d2	- Definition, classification distribution, physical and chemical properties, general methods of extraction, purification and isolation and chemical tests.	1	2
7	Phenyl alkyl amine & purine alkaloids	a a1-a2, b2, c1, d1, d2	Chemistry, biosynthesis, properties, identification, biological sources and medicinal uses	1	2
8	Terpene & Imidazole alkaloids	a1-a2, b2, c1, d1, d2	Chemistry, biosynthesis, properties, identification, biological sources and medicinal uses	1	2
9	Quinine and Isoquinoline alkaloids	a1-a2, b2, c1, d1, d2	Chemistry, biosynthesis, properties, identification,biological sources and medicinal uses	1	2
10	Opium & Tropane & Indole alkaloids	a1-a2, b2, c1, d1, d2	Chemistry, biosynthesis, properties, identification, biological sources and medicinal uses	1	2
11	Marine natural products	a1-a2, b2, c1, d1, d2	Introduction, chemistry, properties, biological sources and medicinal uses	1	2
12	General revision	a1-a2, b2, c1, d1, d2		1	2
13	**Final examination**	a1-a2, b2, c1		1	2
Number of Weeks /and Units Per Semester				**16**	**32**

B - Practical Aspect:

Order	Tasks/ Experiments	Number of Weeks	contact hours	Learning Outcomes
1	Qualitative identification (Macro-	**1**	**2**	**b1, c2, d1,d2**

	chemical tests) of Alkaloids: (Ephedrine, Eserine (Physostigmine), Quinine, Quinidine, Colchicine, Atropine)			
2	Qualitative identification (Macro-chemical tests) of Alkaloids: (Methyl ergometrine, Brucine, Caffeine, Theophylline	**1**	**2**	**b1, c2, d1,d2**
3	General Scheme of Alkaloids using Macro-chemical tests; Unknowns	**1**	**2**	**b1, c1, c2, d1,d2**
4	Micro-crystallization methods for identification of Alkaloids (Caffeine, Ephedrine, Theobromine, Aminophylline, Atropine)	**1**	**2**	**b1, c1, c2, d1,d2**
5	Micro-crystallization methods for identification of Alkaloids: (Quinine, Papaverine, Berberine, Nicotine, Codeine, Strychnine)	**1**	**2**	**b1, c1, c2, d1,d2**
6	General Scheme of Alkaloids using Micro-crystallization methods; Unknowns	**1**	**2**	**b1, c1, c2, d1,d2**
7	Preparation of V.O (distillation method) Quantitative estimation of Aldehydes and Ketones in V.O (Cinnamaldehyde in Cinnamon oil)	**1**	**2**	**b1, c1, c2, d1,d2**
8	Quantitative estimation of Phenols and Oxides in V.O (Eugenol in Clove oil)	**1**	**2**	**b1, c1, c2, d1,d2**
9	Determination of oxides (e.g. cineol in Eucalyptus oil). Determination of peroxides in chenopodium oil	**1**	**2**	**b1, c1, c2, d1,d2**
10	Quantitative estimation of nitrogenous and sulfur volatile constituents (e.g. allyl isothiocyanate in mustard oil)	**1**	**2**	**b1, c1, c2, d1,d2**
11	Analysis of fixed oil: physicochemical constants (melting point, saponification value and iodine value) and	**1**	**2**	**b1, c1, c2, d1,d2**

	specific test.			
12	Presentation of the assignment.	**1**	**2**	**a1, a2, d1, d2**
13	Revision	**1**	**2**	**b1, c1, c2, d1,d2**
14	Practical exam	**1**	**2**	**b1, c1, c2**
Number of Weeks /and Units Per Semester		**14**	**28**	

Teaching strategies of the course:

Lecture and group discussion
Problem based learning,
Practical (lab) classes, Laboratory work
Assignment
Problem-based Learning

VI. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Lab report	**b1, c1, c2, d1,d2**	1-6, 8-11	10%
2	Research assignment	**a1, a2, b1, d1, d2**	12	5%

VII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Attendance/quiz	All	5	5%	
2	Lab reports	1-6, 8-11	10	%10	**b1, c1, c2, d1,d2**
3	Med- Term Exam	7	10	10%	**a1-a2, b2, c1**
4	Research assignment	12	5	5%	**a1, a2, b1, d1, d2**
5	Practical exam	14	30	30%	**b1, c1, c2**
6	Final written exam	16	40	40%	**a1-a2, b2, c1**
	Total		100	100%	

VIII. Learning Resources:

1- Required Textbook(s) (maximum two).

1- Evans, William Charles, Evans, Daphne, & Trease, George Edward. (2009). "Trease and Evans pharmacognosy" (16th ed. / rev. with the assistance of Daphne Evans.). Saunders/Elsevier.

2- Shah Biren N., Seth A.K. (2010). Textbook of Pharmacognosy and Phytochemistry, First Editio Elsevier.
2- Essential References.
1- Varro E. Tyler, Lynn R. (2003) Brady. Pharmacognosy. 3rd Edition. Lea & Febiger. 2- Dewick P. M. (2009)"Medicinal Natural Products, a Biosynthetic Approach", 3rd edition. John Wiley & sons. 3- Harborne J. B. (1984) Phytochemical Methods A GUIDE TO MODERN TECHNIQUES OF PLANT ANALYSIS. (2nd edition). New York. Chapman and Hall.
3- Electronic Materials and Web Sites *etc.*
3- Dr. Duke's Phytochemical and Ethnobotanical Databases (U.S. DEPARTMENT OF AGRICULTURE) https://phytochem.nal.usda.gov/phytochem/search 4- http://www.botanical.com

IX. Course Policies:

1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects**: - Assignments and projects will be assessed individually unless the teacher request for group work
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the faculty rules.
7	**Other policies**:

Template for Course Plan (Syllabus) of Phytochemistry (2)

I. - Information about Faculty Member Responsible for the Course:

		Office Hours					
Name of Faculty Member							
Location& Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Identification and General Information:

1	Course Title:	Phytochemistry (2)				
2	Course Number & Code:	PHA375				
3	Credit hours:	C.H				Total
		Th.	Seminar	Pr.	F. Tr.	
		2		1		3
4	Study level/year at which this course is offered:	3rd year / 2nd semester				
5	Pre –requisite (if any):	Phytochemistry (1)				
6	Co –requisite (if any):	None				
7	Program (s) in which the course is offered	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	Language of teaching the course:	English				
9	System of Study:	Semester				
10	Mode of delivery:	Regular				
11	Location of teaching the course:	University				

III. Course Description:

This course focuses on the study of plants constituents (not included in Phytochemistry I) of crude drugs based on chemical classification (alkaloids, fats, volatile oils and resins) and marine natural products. The study includes methods of isolation, identification, qualitative and quantitative evaluation, medicinal uses, physical and chemical properties, biosynthetic pathway and chemical structure activity relationship. The students also will be able to apply knowledge in performing laboratory experiments.

IV. Course Objectives:

The student will be able to
1- Gain valuable knowledge about the classification, chemistry and biological sources of alkaloids, fats, volatile oils and resins and marine natural products.
2- List the different methods and techniques used for isolation and characterization of alkaloids, fats, volatile oils and resins and marine natural products.
3- Draw and discuss the biosynthetic pathways of the studded compounds.
4- Describe the appropriate methods for their qualitative identification and quantitative estimation, and recognize their pharmaceutical importance.

V. Intended learning outcomes (ILOs) of the course:

Brief summary of the knowledge or skill the course is intended to develop:

1- Demonstrate the essential knowledge of extraction, isolation, purification, characterization, qualitative and quantitative determination of carbohydrates, glycosides, tannins, bitter principles and natural toxins as well as their pharmacological effects.
2- Recognize the biosynthetic pathway and draw the chemical structure of such biologically active compounds.
3- Design appropriate methods for isolation, purification, qualitative and quantitative determination of carbohydrates, glycosides, tannins and bitter principles as natural constituents.
4- Anticipate the physical, chemical and pharmacological properties of carbohydrates, glycosides, tannins, bitter principles and natural toxins.
5- Use the chemical and physical methods for carbohydrates, glycosides and tannins extraction, isolation and purification from their natural origin.
6- Conduct the appropriate method for the carbohydrates, glycosides and tannins qualitative and quantitative determination according to GLP guidelines.
7- Demonstrate time management, independent and team working, decision making and life-long learning skills.
8- Carry out private study, including direct study on specific topics, independent study from textbooks.

VI. Course Content:

- Distribution of Semester Weekly Plan of Course Topics/Items and Activities.

A – Theoretical Aspect:

Order	Topics List	Week Due	Contact Hours
1	**Introduction and Preparation of volatile oils**	1st	2

2	**Biosynthesis and classification of volatile oils.**	2nd	2
3	**Terpene hydrocarbons of volatile oils.**	3rd	2
4	**Oxygenated hydrocarbons of volatile oils.**	4th	2
5	**Sulfur & nitrogen compounds of volatile Oils**. Chemistry, biosynthesis, properties, identification, biological sources and medicinal uses	5th	2
6	**Resins and resin combination** Chemical composition, biological sources and medicinal uses	6th	2
7	**Med term exam**	7th	2
8	**Lipids (fixed oils, fats and waxes)** Definition, classification, chemistry, biosynthesis, properties, identification, biological sources and medicinal uses	8th	2
9	**Alkaloids** Definition, classification distribution, physical and chemical properties, general methods of extraction, purification and isolation and chemical tests.	9th	2
10	**Phenyl alkyl amine & purine alkaloids** Chemistry, biosynthesis, properties, identification, biological sources and medicinal uses	10th	2
11	**Terpene & Imidazole alkaloids** Chemistry, biosynthesis, properties, identification, biological sources and medicinal uses	11th	2
12	**Quinine and Isoquinoline alkaloids** Chemistry, biosynthesis, properties, identification, biological sources and medicinal uses	12th	2
13	**Opium & Tropane & Indole alkaloids** Chemistry, biosynthesis, properties, identification, biological sources and medicinal uses	13th	2
14	**Marine natural products** Introduction, chemistry, properties, biological sources and medicinal uses	14th	2
15	**General revision**	15th	2
16	**Final examination**	16th	2
Number of Weeks /and Units Per Semester		**16**	**32**

B – Practical Aspect:			
Order	**Topics List**	**Week Due**	**Contact Hours**
1	Qualitative identification (Macro-chemical tests) of Alkaloids: (Ephedrine, Eserine (Physostigmine), Quinine, Quinidine, Colchicine, Atropine)	1st	**2**
2	Qualitative identification (Macro-chemical tests) of Alkaloids: (Methyl ergometrine, Brucine, Caffeine, Theophylline	2nd	**2**
3	General Scheme of Alkaloids using Macro-chemical tests; Unknowns	3rd	**2**
4	Micro-crystallization methods for identification of Alkaloids (Caffeine, Ephedrine, Theobromine, Aminophylline, Atropine)	4th	**2**
5	Micro-crystallization methods for identification of Alkaloids: (Quinine, Papaverine, Berberine, Nicotine, Codeine, Strychnine)	5th	**2**
6	General Scheme of Alkaloids using Micro-crystallization methods; Unknowns	6th	**2**
7	Preparation of V.O (distillation method) Quantitative estimation of Aldehydes and Ketones in V.O (Cinnamaldehyde in Cinnamon oil)	7th	**2**
8	Quantitative estimation of Phenols and Oxides in V.O (Eugenol in Clove oil)	8th	**2**
9	Determination of oxides (e.g. cineol in Eucalyptus oil). Determination of peroxides in chenopodium oil	9th	**2**
10	Quantitative estimation of nitrogenous and sulfur volatile constituents (e.g. allyl isothiocyanate in mustard oil)	10th	**2**
11	Analysis of fixed oil: physicochemical constants (melting point, saponification value and iodine value) and specific test.	11th	**2**
12	Presentation of the assignment.	12th	**2**
13	Revision	13th	**2**
14	Practical exam	14th	**2**
Number of Weeks /and Units Per Semester		**14**	**28**

VII. Teaching strategies of the course:

Lecture and group discussion
Problem based learning,
Practical (lab) classes, Laboratory work
Assignment
Problem-based Learning

VIII. Assignments:

No	Assignments	Week Due	Mark
1	Lab report	1-6, 8-11	10%
2	Research assignment	12	5%

IX. Schedule of Assessment Tasks for Students During the Semester:

Assessment	Type of Assessment Tasks	Week Due	Mark	Proportion of Final Assessment
1	Attendance/quiz	All	5	5%
2	Lab reports	1-6, 8-11	10	%10
3	Med- Term Exam	7	10	10%
4	Research assignment	12	5	5%
5	Practical exam	14	30	30%
6	Final written exam	16	40	40%
7	Total		100	100%

X. Learning Resources:

1- Required Textbook(s) (maximum two).

1- Evans, William Charles, Evans, Daphne, & Trease, George Edward. (2009). "Trease and Evans pharmacognosy" (16th ed. / rev. with the assistance of Daphne Evans.). Saunders/Elsevier.
2- Shah Biren N., Seth A.K. (2010). Textbook of Pharmacognosy and Phytochemistry, First Edition, Elsevier.

2- Essential References.

1- Varro E. Tyler, Lynn R. (2003) Brady. Pharmacognosy. 3rd Edition. Lea & Febiger.

2- Dewick P. M. (2009)"Medicinal Natural Products, a Biosynthetic Approach", 3rd edition. John Wiley & sons.
3- Harborne J. B. (1984) Phytochemical Methods A GUIDE TO MODERN TECHNIQUES OF PLANT ANALYSIS. (2nd edition). New York. Chapman and Hall.

3- Electronic Materials and Web Sites *etc*.

1- Dr. Duke's Phytochemical and Ethnobotanical Databases (U.S. DEPARTMENT OF AGRICULTURE) https://phytochem.nal.usda.gov/phytochem/search
2- http://www.botanical.com

XI. Course Policies:

1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam.
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** - Assignments and projects will be assessed individually unless the teacher request for group work.
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course.
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:**

Course Specification of Hospital Pharmacy

I.	Course Identification and General Information:					
1	**Course Title:**	**Hospital pharmacy**				
2	**Course Code & Number:**	**PHA382**				
3	**Credit hours:**	C.H				Total
		Th.	Seminar	practical	Training.	
		2				**2**
4	**Study level/ semester at which this course is offered:**	Third level, second semester				
5	**Pre –requisite (if any):**	Pharmaceutics (3)				
6	**Co –requisite (if any):**	none				
7	**Program (s) in which the course is offered:**	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	**Language of teaching the course:**	English Language				
9	**Study System**	Semester				
10	**Mode of delivery:**	Regular				
11	**Location of teaching the course:**	University				
12	**Prepared By:**	**Dr. Hamad Mahmood Alshabi**				

II. Course Description:

This course covers the functions, organization and administration of pharmaceutical services within the hospital. This course also deals with the pharmacy services offered to in-patients and out-patients. It includes drug distribution, I.V. admixtures, total parenteral nutrition, cytotoxic infusions, therapeutic drug monitoring, and dosage calculations. It also deals with drug incompatibilities and patient counseling.

III. Course Objectives:

Upon successful completion of the course the students should be able to:
1- Recognize the professional roles and responsibilities of hospital pharmacist.
2- Describe the administrative and pharmaceutical services in the hospital.
3- Provide the intended services.

IV.	Course Intended learning outcomes (CILOs) of the course	WRITE Symbol and number of PILOs
a.1	Describe the hospital pharmacy operations, the different inpatient and outpatient hospital pharmacy services and regulatory requirement in the hospital pharmacy settings.	**A5**

a.2	Outline the roles and responsibilities of a hospital pharmacist, the functions of pharmacy and therapeutic committee and the benefits of hospital formulary.	**A4, A5**
b.1	Assess the prescription or medication order for completeness, accuracy, authenticity and legality before preparing or permitting dispensing the patient dose.	**B3**
b.2	Calculate parenteral nutritional needs and the dose of different medications and dosage regimen.	**B3**
b.3	Select the best method for drug distribution in hospitals to enhance healthcare systems.	**B4**
c.1	Accurately process/dispense the prescription orders according to professional standards and legal guidelines.	**C3, C5**
c.2	Counsel patients when dispensing prescription drug to ensure safe and proper use of medicines.	**C4**
d.1	Demonstrate team working, decision making, problem solving and communication skills.	**D1**

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1- Describe the hospital pharmacy operations, the different inpatient and outpatient hospital pharmacy services and regulatory requirement in the hospital pharmacy settings.	- Interactive Lectures - Assignments	- Written Exams (midterm and final) - Quizzes - Assignments & Coursework Activities
a2- Outline the roles and responsibilities of a hospital pharmacist, the functions of pharmacy and therapeutic committee and the benefits of hospital formulary.		

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1- Assess the prescription or medication order for completeness, accuracy, authenticity and legality before preparing or permitting dispensing the patient dose.	- Interactive Lectures - Assignments - Case-Study - Problem-based Learning	- Written Exams (midterm and final) - Quizzes - Assignments & Coursework Activities - Problem Solving Exercise - Cases Presentation
b2- Calculate parenteral nutritional needs and the dose of different medications and dosage regimen.		
b3- Select the best method for drug distribution in hospitals to enhance healthcare systems.		

(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	**Teaching strategies**	**Assessment Strategies**
c1- Accurately process/dispense the prescription orders according to professional standards and legal guidelines.	- Case-Study - Problem-based Learning	- Quizzes - Coursework Activities - Problem Solving Exercise - Cases Presentation
c2- Counsel patients when dispensing prescription drug to ensure safe and proper use of medicines.		

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	**Teaching strategies**	**Assessment Strategies**
d1- Demonstrate team working, decision making, problem solving and communication skills.	- Group discussions. - Case-Study - Problem-based Learning	- Oral Presentation & discussion. - Observation. - Problem Solving Exercise - Cases Presentation

V. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	contact hours
1	**Introduction**	a1, a2	- Hospital pharmacy: definition, organizational structure, functions, objectives and facilities of hospital pharmacy. - Role, duties, and responsibilities of the hospital pharmacist.	**1**	**2**
2	**Pharmacy and therapeutic committee**	a1, a2	- Pharmacy and therapeutic committee: constitution, functions and policies.	**1**	**2**
3	**Hospital formulary**	a1, a2	Hospital formulary: contents, preparation and revision of hospital formulary. Advantages and	**1**	**2**

			disadvantages.		
4	**Drug dispensing and distribution systems in hospitals:**	a1, b1, b2, b3, c1, c2, d1	**1-** Drug distribution to inpatient: Types of drug distribution systems, Advantages and disadvantages. Charging policy and labeling. **2-** Dispensing of drugs to Outpatient/ambulatory patients.	**3**	**6**
5		a1, a2, b1, b2, b3, c1, c2	**Mid-term Exam**	**1**	**2**
6		a1, b1, b2, b3, c1, c2, d1	3- Dispensing of controlled drugs.	**1**	**2**
7	**Inpatient pharmacy services:**	a1, b1, b2, , c1, c2, d1	- Dose adjustment - Intravenous admixtures. - Total Parenteral Nutrition (TPN). - Cytotoxic infusions. - Therapy drug monitoring (TDM).	**5**	**10**
8	**Drug incompatibility**	a1, b1, c1, d1	Drug incompatibility: Definition, types with examples and correction.	**1**	**2**
9	**Patient counseling**	a1, c2, d1	Definition of patient counseling, steps involved in patient counseling and special cases that required the pharmacist.	**1**	**2**
10		a1, a2, b1, b2, b3, c1, c2 d1	**Final Term exam**	**1**	**2**
Number of Weeks /and Units Per Semester				**16**	**32**

VI. Teaching strategies of the course:
- Interactive Lectures - Assignments

- Case-Study - Problem-based Learning - Group discussions.

VII. Assignments:

No	Assignments	Aligned CILOs (symbols)	Week Due	Mark
1	Participation, Homework Evaluation.	**a1, b1, b2, c1, c2, d1**	Weekly	**2.5**
2	Exercises.	**b1, b2, c1, c2, d1**	Weekly	**2.5**
	Total Score			**5**

VIII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Tasks and Assignments	**Weekly**	**5**	**5%**	a1, b1, b2, c1, c2, d1
2	Quizzes 1	**W6**	2.5	2.5%	a1, a2, b1, b2
3	Mid-term exam	**W7**	20	20%	a1, a2, b1, b2, b3, c1, c2
4	Quizzes 2	**W12**	2.5	2.5%	a1-a2, b1, b2,
5	Final exam	**W16**	70	70%	a1, a2, b1, b2, b3, c1, c2, d1
6	**Total**		100	100%	

IX. Learning Resources:

1- Required Textbook(s) (maximum two).

1- Martin Stephens. (2011). Hospital Pharmacy. Second edition. Pharmaceutical Press.
2- Mansoor A. Khan, Indra K. Reddy; 2000. Pharmaceutical and clinical calculations, 2nd edition, CRC Press. Florida, USA.

2- Essential References.

1- David Holdford and Thomas Brown. (2010). Introduction to hospital and health system, pharmacy practice.

3- Electronic Materials and Web Sites *etc*.

X.	Course Policies:
1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** - Assignments and projects will be assessed individually unless the teacher request for group work
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:** -

Template for Course Plan (Syllabus) of Hospital pharmacy

I. Information about Faculty Member Responsible for the Course:								
Name of Faculty Member		**Office Hours**						
Location& Telephone No.		**SAT**	**SUN**	**MON**	**TUE**	**WED**	**THU**
E-mail							

II. Course Identification and General Information:						
1	**Course Title:**	**Hospital pharmacy**				
2	**Course Code & Number:**	**PHA382**				
3	**Credit hours:**	C.H				Total
		Th.	Seminar	practical	Training.	
		2				**2**
4	**Study level/ semester at which this course is offered:**	Third level, second semester				
5	**Pre –requisite (if any):**	Pharmaceutics (3)				
6	**Co –requisite (if any):**	none				
7	**Program (s) in which the course is offered:**	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	**Language of teaching the course:**	English Language				
9	**Study System**	Semester				
10	**Mode of delivery:**	Regular				
11	**Location of teaching the course:**	University				

III. Course Description:

This course covers the functions, organization and administration of pharmaceutical services within the hospital. This course also deals with the pharmacy services offered to in-patients and out-patients. It includes drug distribution, I.V. admixtures, total parenteral nutrition, cytotoxic infusions, therapeutic drug monitoring, and dosage calculations. It also deals with drug incompatibilities and patient counseling.

IV. Course Objectives:

Upon successful completion of the course the students should be able to:
1- Recognize the professional roles and responsibilities of hospital pharmacist.
2- Describe the administrative and pharmaceutical services in the hospital.
3- Provide the intended services.

V. Intended learning outcomes (ILOs) of the course:

Upon successful completion of this course, the student should be able to:

1- Describe the hospital pharmacy operations, the different inpatient and outpatient hospital pharmacy services and regulatory requirement in the hospital pharmacy settings.
2- Outline the roles and responsibilities of a hospital pharmacist, the functions of pharmacy and therapeutic committee and the benefits of hospital formulary.
3- Assess the prescription or medication order for completeness, accuracy, authenticity and legality before preparing or permitting dispensing the patient dose.
4- Calculate parenteral nutritional needs and the dose of different medications and dosage regimen.
5- Select the best method for drug distribution in hospitals to enhance healthcare systems.
6- Accurately process/dispense the prescription orders according to professional standards and legal guidelines.
7- Counsel patients when dispensing prescription drug to ensure safe and proper use of medicines.
8- Demonstrate team working, decision making, problem solving and communication skills.

VI. Course Content:

A – Theoretical Aspect:

Order	Topics List	Week Due	Contact Hours
1	**Introduction:** - Hospital pharmacy: definition, organizational structure, functions, objectives and facilities of hospital pharmacy. - Role, duties, and responsibilities of the hospital pharmacist.	1	2
2	**Pharmacy and therapeutic committee** - constitution, functions and policies.	2	2
3	**Hospital formulary:** contents, preparation and revision of hospital formulary. Advantages and disadvantages.	3	2
4	**Drug dispensing and distribution systems in hospitals:** **1-** Drug distribution to inpatient: Types of drug distribution systems, Advantages and disadvantages. Charging policy and labeling. **2-** Dispensing of drugs to Outpatient/ambulatory patients.	4, 5, 6	6
5	**Mid-term Exam**	7	2
6	3- Dispensing of controlled drugs.	8	2
7	**Inpatient pharmacy services:** - Dose adjustment - Intravenous admixtures.	9, 10, 11, 12, 13	10

	- Total Parenteral Nutrition (TPN). - Cytotoxic infusions. - Therapy drug monitoring (TDM).		
8	**Drug incompatibility:** Definition, types with examples and correction.	14	2
9	**Patient counseling:** Definition of patient counseling, steps involved in patient counseling and special cases that required the pharmacist.	15	2
10	**Final Term exam**	16	2
	Number of Weeks /and Units Per Semester	**16**	**32**

VII. Teaching strategies of the course:

- Interactive Lectures
- Assignments
- Case-Study
- Problem-based Learning
- Group discussions.

VIII. Assignments:

No	Assignments	Week Due	Mark
1	Participation, Homework Evaluation.	Weekly	**2.5**
2	Exercises.	Weekly	**2.5**
	Total Score		**5**

IX. Schedule of Assessment Tasks for Students During the Semester:

Assessment	Type of Assessment Tasks	Week Due	Mark	Proportion of Final Assessment
1	Tasks and Assignments	Weekly	**5**	**5%**
2	Quizzes 1	**W6**	2.5	2.5%
3	Mid-term exam	**W7**	20	20%
4	Quizzes 2	**W12**	2.5	2.5%
5	Final exam	**W16**	70	70%
6	**Total**		100	100%

X. Learning Resources:
1- Required Textbook(s) (maximum two).
1- Martin Stephens. (2011). Hospital Pharmacy. Second edition. Pharmaceutical Press. 2- Mansoor A. Khan, Indra K. Reddy; 2000. Pharmaceutical and clinical calculations, 2nd edition, CRC Press. Florida, USA.
2- Essential References.
1- David Holdford and Thomas Brown. (2010). Introduction to hospital and health system, pharmacy practice.
3- Electronic Materials and Web Sites *etc*.

XI. Course Policies:	
1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam.
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** - Assignments and projects will be assessed individually unless the teacher request for group work.
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course.
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:**

Fourth level, first semester

Course Specification of Research Methodology & Biostatistics

I. Course Identification and General Information:

1	Course Title:	Research Methodology & Biostatistics				
2	Course Code & Number:	MED416				
3	Credit hours:	C.H				TOTAL
		Th.	Seminar	practical	Training.	
		2				2
4	Study level/ semester at which this course is offered:	*Fourth level, first semester*				
5	Pre –requisite (if any):	None				
6	Co –requisite (if any):	None				
7	Program (s) in which the course is offered:	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	Language of teaching the course:	English/ Arabic				
9	Study System	*semester*				
10	Mode of delivery:	Regular				
11	Location of teaching the course:	University				
12	Prepared By:	Dr. Mukhtar Al-Tamimi				

II. Course Description:

The first part of this course provides an introduction to selected important topics in biostatistical concepts. It covers the following topics: Introduction, Strategies to understanding the meaning of data, Measures of central tendency, Measures of dispersion, Inferential statistics, Probability, Normal distribution, Population parameters, Hypothesis testing.

The second part of this course is concerned with the basics of research methodology and includes Types of clinical study designs, Designing the methodology, Sampling and sampling techniques, Report writing and presentation of data.

III. Course Objectives:

At the end of the course the candidate will be able to identify the basic concepts of Biostatistics and data analysis and scientific research methodology.

IV. Course Intended learning outcomes (CILOs) of the course		WRITE Symbol an number of PILO
a.1	Identify the different kinds of study designs and different methods of sampling technique, data collection, analysis, presentation and	A1

	interpretation of results.	
a.2	Outline the measures of central tendency and the measures of dispersion and the concepts of probability, normal distribution and population parameters.	A5
a.3	Discuss the concept of hypothesis testing in a parametric and a nonparametric setting.	A5
b.1	Design a research strategy.	B3
b.2	Assess and evaluate different experimental techniques in the selected pharmacy research field.	B4
c.1	Design experiments in the lab and field within proper scientific basis.	C1
c.2	Observe, record, and analyze data properly and ethically.	C5
d.1	Collect, evaluate and present data in accordance with standard mathematical and statistical methods.	D1
d.2	Retrieve pharmaceutical, clinical and other drug information resources.	D2,D3

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1- Identify the different kinds of study designs and different methods of sampling technique, data collection, analysis, presentation and interpretation of results.	Interactive lecture, Group discussion, Presentation	Assignments, reports, written exam, oral exam
a2- Outline the measures of central tendency and the measures of dispersion and the concepts of probability, normal distribution and population parameters.	Interactive lecture, Group discussion, Presentation	Assignments, reports, written exam, oral exam
a3- Discuss the concept of hypothesis testing in a parametric and a nonparametric setting.	Interactive lecture, Group discussion, Presentation, practice	Assignments, reports, written exam, oral exam

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1- Design a research strategy.	Interactive lecture, Group	Assignments, reports, written

	discussion, Presentation	exam, oral exam
b2- Assess and evaluate different experimental techniques in the selected pharmacy research field	Interactive lecture, Group discussion, Presentation	Assignments, reports, written exam, oral exam

(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1- Design experiments in the lab and field within proper scientific basis.	Interactive lecture, Group discussion, Presentation	Assignments, reports, written exam, oral exam
c2- Observe, record and analyze data properly	Interactive lecture, Group discussion, Presentation	Assignments, reports, written exam, oral exam

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1- Collect, evaluate and present data in accordance with standard mathematical and statistical methods.	Interactive lecture, Group discussion, Presentation	Assignments, reports, written exam, oral exam
d2- Retrieve pharmaceutical, clinical and other drug information resources.	Interactive lecture, Group discussion, Presentation	Assignments, reports, written exam, oral exam

V. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	contact hours
1	Biostatistics	a1,a2, b1, d1	- Introduction to Biostatistics - Strategies to understanding the meaning of data (descriptive statistics)	**1**	**2**
2	Measures of central tendency and dispersion	a1,a2,a3, b1, d1	- Measures of central tendency (mean, median, mode) - Measures of dispersion (range, variance and standard deviation)	**2**	**4**
3	Inferential statistics	a2,a3, b1, d1	- Inferential statistics - Probability	**1**	**2**
4	Normal distribution	a1,a2, b1,b2 d1	- Normal distribution - Population parameters	**1**	**2**

5	Hypothesis testing	a1,a2, b1,b2 d1,2,d3	- Hypothesis testing (one sample t test, student t test, ANOVA)	**1**	**2**
6	Non parametric hypothesis testing	a1, a2, b1, b2, c1, c2, d1, d2	-Non parametric hypothesis testing (rank sum test) - Non parametric hypothesis testing (sign test)	**1**	**2**
7	**Mid-Term exam**	a1, a2, a3, b1, b2, c1, c2, d1, d2, d3		**1**	**2**
8	Research Methodology	a1, a2, a3, b1, b2, c1, c2, d1, d2	- Types of clinical study designs: Case studies, observational studies, interventional studies	**2**	**4**
9	Research Methodology	a1, a2, a3, b1, b2, c1, c2, d1, d2	- Designing the methodology	**2**	**4**
10	Research Methodology	a1, a2, a3, b1, b2, c1, c2, d1, d2, d3	- Sampling and sampling techniques	**1**	**2**
11	Research Methodology	a1, a2, a3, b1, b2, c1, c2, d1, d2, d3	- Report writing	**1**	**2**
12	Research Methodology	a1, a2, a3, b1, b2, c1, c2, d1, d2, d3	- Presentation of data	**1**	**2**
13	**Final Exam**	a1, a2, a3, b1, b2, c1, c2, d1, d2, d3		**1**	**2**
Number of Weeks /and Units Per Semester				**16**	**32**

B - Practical Aspect: (if any)

Order	Tasks/ Experiments	Number of Weeks	contact hours	Learning Outcomes
1	Not applicable			
2				
Number of Weeks /and Units Per Semester				

VI. Teaching strategies of the course:
Active Lectures
Interactive Class Discussions
Directed self- study
Exercises and home works
Individual and Group Case Studies

VII. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Write in literature review regarding side effects for one of the most commonly used medicine in Taiz?	a1, a2, a3, b1, b2, c1, c2, d1, d2, d3	11,12	5

VIII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Attendance, Quizzes and Activities	1-12	5	5%	a1, a2, a3, b1, b2, c1, c2, d1, d2, d3
2	Student assignment	11, 12	5	5%	a1, a2, a3, b1, b2, c1, c2, d1, d2, d3
3	Mid-term exam	8	20	20%	a1, a2, a3, b1, b2, c1, c2, d1, d2, d3
4	Final exam	16	70	70%	a1, a2, a3, b1, b2, c1, c2, d1, d2, d3

IX. Learning Resources:

1- Required Textbook(s) (maximum two).

1- Biostatistics: The Bare Essentials, People's Medical Publishing House - USA, Ltd.; 4th edition (May 30, 2014)
2- Understanding research methods and statistics, Heiman GW (Ed), 2nd edn

2- Essential References.

3- course notes.
4- Biostatistics, Basic concepts and methodology for the health sciences, 10th Edition, Wiley. 2014
5- Biostatistics, Basic concepts and methodology for the health sciences, 10th Edition, Wiley. 2014

3- Electronic Materials and Web Sites *etc.*

X. Course Policies:

1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects**: - Assignments and projects will be assessed individually unless the teacher request for group work
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course

6	**Plagiarism:** Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the faculty rules.
7	**Other policies**: -

Template for Course Plan (Syllabus) of Research Methodology & Biostatistics

I. - Information about Faculty Member Responsible for the Course:

Name of Faculty Member	Faculty of Medicine and Medical Sciences	Office Hours					
Location& Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Identification and General Information:

1	Course Title:	Research Methodology & Biostatistics				
2	Course Number & Code:	MED416				
3	Credit hours:	C.H				Total
		Th.	Seminar	Pr.	F. Tr.	
		2				2
4	Study level/year at which this course is offered:	*Fourth level, first semester*				
5	Pre –requisite (if any):	None				
6	Co –requisite (if any):	None				
7	Program (s) in which the course is offered	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	Language of teaching the course:	English/ Arabic				
9	System of Study:	Semester				
10	Mode of delivery:	Regular				
11	Location of teaching the course:	University				

III. Course Description:

The first part of this course provides an introduction to selected important topics in biostatistical concepts. It covers the following topics: Introduction, Strategies to understanding the meaning of data, Measures of central tendency, Measures of dispersion, Inferential statistics, Probability, Normal distribution, Population parameters, Hypothesis testing.

The second part of this course is concerned with the basics of research methodology and includes Types of clinical study designs, Designing the methodology, Sampling and sampling techniques, Report writing and presentation of data.

IV. Course Objectives:

At the end of the course the candidate will be able to identify the basic concepts of Biostatistics and data analysis and scientific research methodology.

V. Intended learning outcomes (ILOs) of the course:

Brief summary of the knowledge or skill the course is intended to develop:

1. Identify the different kinds of study designs and different methods of sampling technique, data collection, analysis, presentation and interpretation of results.
2. Outline the measures of central tendency and the measures of dispersion and the concepts of probability, normal distribution and population parameters.
3. Discuss the concept of hypothesis testing in a parametric and a nonparametric setting.
4. Design a research strategy.
5. Assess and evaluate different experimental techniques in the selected pharmacy research field.
6. Design experiments in the lab and field within proper scientific basis.
7. Observe, record, and analyze data properly and ethically.
8. Collect, evaluate and present data in accordance with standard mathematical and statistical methods.
9. Retrieve pharmaceutical, clinical and other drug information resources.

VI. Course Content:

- Distribution of Semester Weekly Plan of Course Topics/Items and Activities.

A – Theoretical Aspect:

Order	Topics List	Week Due	Contact Hours
1	Biostatistics	1	2
2	Measures of central tendency and dispersion	2, 3	4
3	Inferential statistics	4	2
4	Normal distribution	5	2
5	Hypothesis testing	6	2
6	Non parametric hypothesis testing	7	2

7	Mid-term exam	**8**	**2**
8	Research Methodology	**9, 10**	**4**
9	Research Methodology	**11, 12**	**4**
10	Research Methodology	**13**	**2**
11	Research Methodology	**14**	**2**
12	Research Methodology	**15**	**2**
13	Final exam	**16**	**2**
Number of Weeks /and Units Per Semester		**16**	**32**

VII. Teaching strategies of the course:

Active Lectures
Interactive Class Discussions
Directed self- study
Exercises and home works
Individual and Group Case Studies

VIII. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Write in literature review regarding side effects for one of the most commonly used medicine in Taiz?	a1, a2, a3, a4, a5, a6, b1, b2, b3, b4, b5, c1, c2, c3, c4, c5, c6, d1, d2, d3, d4	11,12	15
2				

IX. Schedule of Assessment Tasks for Students During the Semester:

Assessment	Type of Assessment Tasks	Week Due	Mark	Proportion of Final Assessment

1	Attendance, Quizzes and Activities	1-12	5	5%
2	Student assignment	11, 12	5	5%
3	Mid-term exam	8	20	20%
6	Final exam	16	70	70%

X. Learning Resources:

1- Required Textbook(s) (maximum two).

1. Biostatistics: The Bare Essentials, People's Medical Publishing House - USA, Ltd.; 4th edition (May 30, 2014)
2. Understanding research methods and statistics, Heiman GW (Ed), 2nd edn

2- Essential References.

1. course notes.
2. Biostatistics, Basic concepts and methodology for the health sciences, 10th Edition, Wiley. 2014
3. Biostatistics, Basic concepts and methodology for the health sciences, 10th Edition, Wiley. 2014

3- Electronic Materials and Web Sites *etc*.

XI. Course Policies:

1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam.
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** - Assignments and projects will be assessed individually unless the teacher request for group work.
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course.
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:**

Specification of Medicinal chemistry (3)

I. Course Identification and General Information:

1	Course Title:	**Medicinal chemistry (3)**				
2	Course Code & Number:	**PHA435**				
3	Credit hours:	C.H				TOTAL
		Th.	Seminar	practical	Training.	
		2		1		3
4	Study level/ semester at which this course is offered:	4 th year / 1st semester				
5	Pre –requisite (if any):	Medicinal chemistry (2)				
6	Co –requisite (if any):	None				
7	Program (s) in which the course is offered:	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	Language of teaching the course:	English Language				
9	Study System	Semester-based				
10	Mode of delivery:	Regular				
11	Location of teaching the course:	University				
12	Prepared By:	Mohammed Hassan				

II. Course Description:

The course is concerned with the chemical structure, nomenclature, biosynthesis, synthesis, classification, metabolism, uses and structure activity relationship (SAR) of CNS Depressants, CNS Stimulants, Opioids, local anesthetic drugs and hormones. The practical part includes the qualitative and quantitative determination and synthesis of some drugs in this course.

III. Course Objectives:

This course aims to:

1. Provide students knowledge about the chemistry of studied drugs.
2. Comprehending the relationship between the chemical structure of these drugs and their physicochemical properties, pharmacokinetics, biological activity, together with their mode of action.
3. Learn students the skills in drug design using SAR
4. Train students practical and professional skills.

IV. Course Intended learning outcomes (CILOs) of the course		WRITE Symbo and number of PILOs
After completing this course, students will be able to:		
a.1	Recognize the chemical classification, chemical structure, synthesis methods and mode of action of studied classes of drugs	A2, A3
a.2	Illustrate the structure activity relationship (SAR) and metabolism of studied drugs.	A3
a.3	Explain the physicochemical properties and their effect on pharmacokinetic and pharmacodynamic profile of studied drugs	
b.1	Predict the biological activity and metabolism pathways of drugs based on chemical structure.	B1
b.2	Select appropriate methods for the identification and analysis of various drugs.	B2
c1	Perform identification, assay and synthesis of selected drugs.	C1
c.2	Apply the given information to evaluate the activity of related drugs based on structural similarities and dissimilarities.	
d.1	Demonstrate critical thinking, decision making, team working, communication and research skills.	D1, D3

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
After completing this course, students will be able to:		
a1- Recognize the chemical classification, chemical structure, synthesis methods and mode of action of studied classes of drugs	- Lectures and Groups discussion - tutorial. - Simulation	- In-class participation - Quizzes - Homework, Reports. - Written exam.
a2- Illustrate the structure activity relationship (SAR) and metabolism of studied drugs.		

a3- Explain the physicochemical properties and their effect on pharmacokinetic and pharmacodynamic profile of studied drugs		

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
After completing this course, students will be able to:	- Lectures and Groups discussion. - Problem solving Sessions. - Brainstorming	- In-class participation - Quizzes - Homework, Reports. - Written exam.
b1- Predict the biological activity and metabolism pathways of drugs based on chemical structure.		
b2- Select appropriate methods for the identification and analysis of various drugs.		

(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
After completing this course, students will be able to:	- Lectures and group discussion. - Brainstorming. - Simulated software programs.	Simulated software programs works, Homework, Reports
c1- Perform identification, assay and synthesis of selected drugs.		
c2- Apply the given information to evaluate the activity of related drugs based on structural similarities and dissimilarities.		

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
After completing this course, students will be able to:	- discussions. - Research in library and web. - Self –learning	- Presentation & discussion - Homework Evaluation. - Reports' Evaluation.
d1- Demonstrate critical thinking, decision making, team working, communication and research skills.		

V. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Learning Outcomes	Sub Topics List	No. of Weeks	contact hours
1	**CNS Depressant drugs**	a1, a2, a3, b1, c2, d1	Sedatives, hypnotics anxiolytics, Antipsychotics, Antiepileptics, Skeletal Muscle Relaxants	3	6
2	**CNS Stimulant drugs**	a1, a2, a3, b1, c2, d1	Antidepressant, antiparkinsonism, analeptics, Methylxanthine, Psychomotor stimulants	2	4
3	**General & local anaesthetics**	a1, a2, a3, b1, c2, d1	Classification, synthesis, SAR, metabolism	1	2
4	**Opioids & analgesics antipyretics and anti-gout**	a1, a2, a3, b1, c2, d1	Classification, opioid receptors,synthesis, SAR, metabolism	1	2
5	**Midterm**	a1, a2, a3, b1, c2		1	2
6	**Thyroid & Antithyroid Drugs**	a1, a2, a3, b1, c2, d1	Mechanism of Thyroid hormones formation. **Thyroid drugs:** natural thyroid hormone preparations & synthetic thyroid hormone. **Antithyroid drugs**	1	2
7	**Sex hormones**	a1, a2, a3, b1, c2, d1	Female sex hormones: estrogen & progesterone Male sex hormone: androgens & antiandrogens	2	4
8	**Corticosteroids**	a1, a2, a3, b1, c2, d1	Glucocorticoids & Mineralocorticoids	2	4
9	**Peptide, protein hormones and peptidomimetics**	a1, a2, a3, b1, c2, d1	Peptide, protein hormones and peptidomimetics	1	2
10	**Insulin & antidiabetic agents**	a1, a2, a3, b1, c2, d1	Insulin preparations Oral hypoglycemic drugs	1	2

11	**Final Exam**	a1, a2, a3, b1, c2		1	2
Number of Weeks /and Units Per Semester				**16**	**32**

B- Practical Aspect:

Order	Tasks/ Experiments	No. of Weeks	contact hours	Learning Outcomes
1	Assay of impiramin	1	2	a3, b2, c1, d1
2	Identification of aspirin	1	2	a3, b2, c1, d1
3	Assay of aspirin	1	2	a3, b2, c1, d1
4	Identification of ibuprofen tab	1	2	a3, b2, c1, d1
5	Assay of ibuprofen tab	1	2	a3, b2, c1, d1
6	Assay of indomethacin	1	2	a3, b2, c1, d1
7	Assay of metformin	1	2	a3, b2, c1, d1
8	Assay of propranolol hydrochloride tab	1	2	a3, b2, c1, d1
9	Assay of Mefenamic acid	1	2	a3, b2, c1, d1
10	Assay of normal saline 0.9	1	2	a3, b2, c1, d1
11	Assay of Paracetamol	1	2	a3, b2, c1, d1
12	Synthesis of Paracetamol	1	2	a3, b2, c1, d1
13	Assay of dydrogestrone	1	2	a3, b2, c1, d1
14	Final exam	1	2	a3, b2, c1
Number of Weeks /and Units Per Semester		**14**	**28**	

VI. Teaching strategies of the course:

- Lectures and Groups discussion
- tutorial.
- Simulation
- Problem solving Sessions.
- Brainstorming
- Simulated software programs.
- Research in library and web.
- Self –learning

VII. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Activities	a2, b1, c2, d1	Every 2 weeks	5

VIII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Assignments	Every 2 weeks	5	5%	a2, b1, c2, d1
2	Quizzes	4	5	5%	a1, a2, a3, b1
3	Mid-Term Exam	8	10	10%	a1, a2, a3, b1, c2
4	Practical lab work	Every week	10	10%	a3, b2, c1, d1
5	Final exam of Practical	14	30	30%	a3, b2, c1
6	Final exam of Theoretical	16	40	40%	a1, a2, a3, b1, c2
	Total		**100**	**100%**	

IX. Learning Resources:

1- Required Textbook(s) (maximum two).

1- John M. Beale, Jr. and John H. Block, 2011, "Text book of Organic Medicinal and Pharmaceutical Chemistry" 12th Edition, Wilson and Gisvold, Lippincott Williams and Wilkins, A Wolters Kluwer Company, Philadelphia.

2- Graham L. Patrick, 2017, "An Introduction to Medicinal Chemistry" 5th Edition, Oxford University Press Inc, New York.

2- Essential References.

1- Thomas L. Lemke, Victoria F. Roche, David A. Willaiams and S. William Zito, 2008, "Foye's Principles of Medicinal Chemistry" 6 th, Edition, Lippincott Williams & Wilkins, a Wolters Kluwer business, Philadelphia.

2- Thomas Nogrady, Donald F. Weaver, 2005, Medicinal Chemistry A Molecular and Biochemical Approach, 3rd edition, Oxford University Press, Inc., New York.

3- Donald J. Abraham," BURGER'S Medicinal Chemistry and Drug Discovery" 6 th edition, A John Wiley and Sons, Inc, Virginia.

3- Electronic Materials and Web Sites *etc*.
1- www. Pharmchem. Ku.edu/ 2- http://www.chemaxon/marvin 3- http://www.webmolecules.com 4-http://www.acdlabs.com 5-PASS Prediction of Activity Spectra for Substance) (http://www.ibmh.msk.su/PASS

X. Course Policies:	
1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** - Assignments and projects will be assessed individually unless the teacher request for group work
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:**

Template for Course Plan (Syllabus) of Medicinal chemistry (3)

I. - Information about Faculty Member Responsible for the Course:

Name of Faculty Member		Office Hours					
Location& Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Identification and General Information:

1	Course Title:	**Medicinal chemistry (3)**				
2	Course Code & Number:	**PHA435**				
3	Credit hours:	C.H				TOTAL
		Th.	Seminar	practical	Training.	
		2		1	-	3
4	Study level/ semester at which this course is offered:	4 th year / 1st semester				
5	Pre –requisite (if any):	**Medicinal chemistry (2)**				
6	Co –requisite (if any):	None				
7	Program (s) in which the course is offered:	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	Language of teaching the course:	English Language				
9	Study System	Semester-based				
10	Mode of delivery:	Regular				
11	Location of teaching the course:	University				

III. Course Description:

The course is concerned with the chemical structure, nomenclature, biosynthesis, synthesis, classification, metabolism, uses and structure activity relationship (SAR) of CNS Depressants, CNS Stimulants, Opioids, local anesthetic drugs and hormones. The practical part includes the qualitative and quantitative determination and synthesis of some drugs in this course.

IV. Course Objectives:

This course aims to:

1. Provide students knowledge about the chemistry of studied drugs.
2. Comprehending the relationship between the chemical structure of these drugs and their physicochemical properties, pharmacokinetics, biological activity, together with their mode of action.
3. Learn students the skills in drug design using SAR.
4. Train students practical and professional skills.

V. Course Intended learning outcomes (CILOs) of the course

After completing this course, students will be able to:	
1	Recognize the chemical classification, chemical structure, synthesis methods and mode of action of studied classes of drugs
2	Illustrate the structure activity relationship (SAR) and metabolism of studied drugs.
3	Explain the physicochemical properties and their effect on pharmacokinetic and pharmacodynamic profile of studied drugs
4	Predict the biological activity and metabolism pathways of drugs based on chemical structure.
5	Select appropriate methods for the identification and analysis of various drugs.
6	Perform identification, assay and synthesis of selected drugs.
7	Apply the given information to evaluate the activity of related drugs based on structural similarities and dissimilarities.
8	Demonstrate critical thinking, decision making, team working, communication and research skills.

VI. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Sub Topics List	Week due	contact hours
1	CNS Depressant drugs	Sedatives, hypnotics, anxiolytics Antipsychotics, Antiepileptics, Skeletal Muscle Relaxants	1, 2, 3	6
2	CNS Stimulant drugs	Antidepressants, antiparkinsonism,	4, 5	4

		analeptics, Methylxanthine, Psychomotor stimulants		
3	General & local anaesthetics	Classification, synthesis, SAR, metabolism	6	2
4	Opioid Agonists & Antagonists local anaesthetics	Classification, opioid receptors, synthesis, SAR, metabolism	7	2
5	Midterm		8	2
6	Thyroid & Antithyroid Drugs	Mechanism of Thyroid hormones formation. **Thyroid drugs:** natural thyroid hormone preparations & synthetic thyroid hormone. **Antithyroid drugs**	9	2
7	Sex hormones	Female sex hormones: estrogen & progesterone Male sex hormone: androgens & antiandrogens	10, 11	4
8	Corticosteroids	Glucocorticoids & Mineralocorticoids	12, 13	4
9	Peptide, protein hormones and peptidomimetics	Peptide, protein hormones and peptidomimetics	14	2
10	Insulin & antidiabetic agents	Insulin preparations Oral hypoglycemic drugs	15	2
11	Final Exam		16	2
Number of Weeks /and Units Per Semester			**16**	**32**

B – Practical Aspect: ***(if any)***			
Order	**Topics List**	**Week Due**	**Contact Hours**
1	Assay of impiramin	**1st**	2
2	Identification of aspirin	2nd	2
3	Assay of aspirin	3rd	2
4	Identification of ibuprofen tab	4th	2

5	Assay of ibuprofen tab	5th	2
6	Assay of indomethacin	6th	2
7	Assay of metformin	7th	2
8	Assay of propranolol hydrochloride tab	8th	2
9	Assay of Mefenamic acid	9th	2
10	Assay of normal saline 0.9	**10th**	2
11	Assay of Paracetamol	11th	2
12	Synthesis of Paracetamol	**12th**	2
13	Assay of dydrogestrone	**13th**	2
14	Final exam	**14th**	2
Number of Weeks /and Units Per Semester			

VII. Teaching strategies of the course:

- Lectures and Groups discussion
- tutorial.
- Simulation
- Problem solving Sessions.
- Brainstorming
- Simulated software programs.
- Research in library and web.

Self –learning

VIII. Assignments:

No	Assignments	Week Due	Mark
1	Activities	Every 2 weeks	5

IX. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Assignments	Every 2 weeks	5	5%	
2	Quizzes	4	5	5%	
3	Mid-Term Exam	8	10	10%	
4	Practical lab work	Every week	10	10%	
5	Final exam of Practical	14	30	30%	
6	Final exam of Theoretical	16	40	40%	
	Total		**100**	**100%**	

X. Learning Resources:

1- Required Textbook(s) (maximum two).

1- John M. Beale, Jr. and John H. Block, 2011, "Text book of Organic Medicinal and Pharmaceutical Chemistry" 12th Edition, Wilson and Gisvold, Lippincott Williams and Wilkins, A Wolters Kluwer Company, Philadelphia.
2- Graham L. Patrick, 2017, "An Introduction to Medicinal Chemistry" 5th Edition, Oxford University Press Inc, New York.

2- Essential References.

1- Thomas L. Lemke, Victoria F. Roche, David A. Willaiams and S. William Zito, 2008, "Foye's Principles of Medicinal Chemistry" 6 th, Edition,., Lippincott Williams & Wilkins, a Wolters Kluwer business, Philadelphia.
2- Thomas Nogrady, Donald F. Weaver, 2005, Medicinal Chemistry A Molecular and Biochemical Approach, 3rd edition, Oxford University Press, Inc., New York.
3- Donald J. Abraham," BURGER'S Medicinal Chemistry and Drug Discovery" 6 th edition, A John Wiley and Sons, Inc, Virginia.

3- Electronic Materials and Web Sites *etc*.

1- www. Pharmchem. Ku.edu/
2- http://www.chemaxon/marvin
3- http://www.webmolecules.com
4-http://www.acdlabs.com
5-PASS Prediction of Activity Spectra for Substance) (http://www.ibmh.msk.su/PASS

	XI. Course Policies:
1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam.
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3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** - Assignments and projects will be assessed individually unless the teacher request for group work.
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course.
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:**

Template for Course Specification of Biotechnology and Pharmacogenomics

I. Course Identification and General Information:

1	**Course Title:**	**Biotechnology and Pharmacogenomics**				
2	**Course Code & Number:**					
3	**Credit hours:**	C.H				TOTAL
		Th.	Seminar	Pr	Tr.	
		Theory 2	Seminars, exercises..	Practical	Field, training	**2 Hs**
4	**Study level/ semester at which this course is offered:**	4th Year/ 1st semester				
5	**Pre –requisite (if any):**	Biopharmaceutics, immunology				
6	**Co –requisite (if any):**					
8	**Program (s) in which the course is offered:**	Bachelor of Pharmaceutical Sciences				
9	**Language of teaching the course:**	English				
10	**Location of teaching the course:**	**Faculty of medical and health sciences, Al-Saeed University**				
11	**Prepared By:**	**Waheed Abdulbari Moqbel Alsowaidy**				

I. Course Description:

This course is aimed to provide the student with the essential knowledge about the development and the application of biotechnology in pharmacy, including genetic dogma, the development of novel products, such as drugs hormones and vaccines. This course also discusses gene therapy and genetic basis of variability in drug response that contribute to drug efficacy and toxicity, adverse drug reactions and drug-gene interaction derived diagnostic aids/tests.

II. Course Objectives:

This course aims to:

- Provide an overview of DNA and gene structures, transcription and translation.
- Identify application of some biotechnologies used for the discovery and design of novel drugs for therapeutic purposes.
- Describe the production requirements and restrictions of biopharmaceuticals under different conditions.
- Describe and evaluate examples of biotechnology-related pharmaceuticals and other derived products in different sectors.

- Describe the basic principles of genetic inheritance and variability in humans.
- Explain the major techniques for investigating human genetic variability
- Describe how human genetic variability can impact drug action
- Define genetic biomarkers and explain how they are incorporated into drug development and monitoring.

III.	**Course Intended learning outcomes (CILOs) of the course**	WRITE Symbol and number of PILOs
a.1	Describe the composition and technology of biopharmaceutical drug production and development and use of the gene therapy.	A2
a.2	Explain (by giving examples) the components of, and challenges in development of biological and drugs in pharmaceutical and biotechnology industry.	A2
a.3	Describe how human genetic variability can impact drug action.	A3
b.1	Predict how the differences in gene composition may affect the composition of products coded by this gens.	B1
b.2	Use your knowledge to resonate how human genetic variability can impact drug action.	B2,B3
c.1	Give the patients advice and reasons about differences in their responses to the same medications.	C2
d.1	Assess the requirements of research and resources of Information related to biotechnoogy and pharmacogenomics.	D2

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:

Knowledge and Understanding	Teaching strategies	Assessment Strategies
a.1- Describe the composition and technology of biopharmaceutical drug production and development and use of the gene therapy.	Lectures, seminars	Written examination. Semenar presentation assessment
a.2- Explain (by giving examples) the components of, and challenges in development of biological and drugs in pharmaceutical and biotechnology industry.	Lecture , tutorials, modules	Written exams, tutorial assessment.
a.3 Describe how human genetic variability can impact drug action.		

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Intellectual Skills	Teaching strategies	Assessment Strategies
b1- Predict how the differences in gene composition may affect the composition of products coded by this gens.	Lecture, Problem-solving exercises	Written examination, Quizzes.
b2- Analyze how human genetic variability can impact drug action.		

© Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1- Give the patients advice and reasons about differences in their responses to the same medications.	homework, Videos, seminars	seminar discussion, homework assessment
(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1- Assess the requirements of research and resources of Information related to biotechnology and pharmacogenomics.	Tutorials, field visits	Field visits and tutorial assessment

IV. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Learning Outcomes	Number of Weeks	contact hours
1	**Introduction** - Biotechnology; definitions and importance. - Nucleic acids and gens definitions, compositions. - DNA duplication, transcription and translation. - Protein synthesis and structure.	a1, a2,b1,b2	2	4
2	- Fermentation	a1, a2,a3, b1,b2	1	2
3	- PCR - Recombinant DNA technology. - Production of hormones and other products using recombinant DNA technology	a1, a2,a3, b1,b2,d1	2	4
4	- Monoclonal antibodies production	a1, a2,a3, b1,b2,d1	1	2

	- Gene therapy			
5	- Vaccines technology	a1, a2,a3, b1,d1	1	2
6	**Midterm Exam**	**a1, a2,a3, b1,d1**	1	2
7	- Introduction into pharmacogenomics (definitions and meaning) - Genetic polymorphism in pharmacology	a3, b1,b2	1	2
8	- Undesirable effects and pharmacogenetics	a1, a2, a3,b1, b2, d1	1	2
9	- Genetic polymorphism of receptors	a1, a2, a3,b1, b2, d1	1	2
10	- Drug metabolism and genetic diversity	a1, a2, a3,b1, b2, c1,d1	1	2
11	- Selected diseases and examples of changed body response to drugs	a1, a2, a3,b1, b2, c1,d1	1	2
12	- Genetic tests in pharmacogenetics	a1, a2, a3,b1, b2, c1,d1	1	2
13	- Revision	a1, a2, a3,b1, b2, c1,d1	1	2
14	**Final Exam**	**a1, a2, a3,b1, b2, c1,d1**	1	2
Number of Weeks /and Units Per Semester				

V. Teaching strategies of the course:

Lecture, Problem- solving exercises,

Homework, Tutorials, seminars

VI. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	homework	a1, a2, a3,b1, b2, c1	12th	5
2	Tutorial	a1, a2, a3,b1, b2, c1,d1	14th	5
3	Midterm	a1, a2, a3,b1, b2, c1,d1	8th	20
4	Final Exam	a1, a2, a3,b1, b2, c1,d1	16th	70

VII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	homework	12th	5	5%	a1, a2, a3,b1, b2, c1
2	Tutorial	14th	5	5%	a1, a2, a3,b1, b2, c1,d1
3	Midterm	8th	20	20%	a1, a2, a3,b1, b2, c1,d1
4	Final Exam	16th	70	70%	a1, a2, a3,b1, b2, c1,d1

VIII. Learning Resources:

- *Written in the following order: (Author - Year of publication – Title – Edition – Place of publication – Publisher).*

1- Required Textbook(s) (maximum two).

- Biotechnology and Biopharmaceuticals: Transforming Proteins and Genes into Drugs, Rodney J.Y. Ho, Milo Gibaldi (John Wiley & Sons, Ltd. Hoboken, New Jersey, USA, 2003)

2- Essential References.

- Pharmaceutical Microbiology, Hugo Russell, , Sixth edition, Blackwell Science, (2005).

3- Electronic Materials and Web Sites *etc.*

IX. Course Policies:

1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2	**Tardy:** - Any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - Any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.

4	**Assignments & Projects**: - Assignments and projects will be assessed individually unless the teacher request for group work
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course
6	**Plagiarism**: - Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the faculty rules.
7	**Other policies**: -

Template for Course Plan (Syllabus) of Biotechnology and Pharmacogenomics

VI. - Information about Faculty Member Responsible for the Course:

Name of Faculty Member	Waheed Abdulbari Moqbel Alsowaidy	Office Hours					
Location& Telephone No.	Taiz; 773425333	SAT	SUN	MON	TUE	WED	THU
E-mail	Waheed22sr@gmail.com	6		6		6	

VII. Course Identification and General Information:

1	Course Title:	Biotechnology and Pharmacogenomics				
2	Course Number & Code:					
3	Credit hours:	C.H				Total
		Th.	Seminar	Pr.	F. Tr.	
		Theory 2	Seminars, exercises..	practical	Field, training	2
4	Study level/year at which this course is offered:	Biopharmaceutics, immunology				
5	Pre –requisite (if any):	Biopharmaceutics, immunology				
6	Co –requisite (if any):					
7	Program (s) in which the course is offered	Bachelor of Pharmaceutical Sciences				
8	Language of teaching the course:	English				
9	System of Study:					
10	Mode of delivery:	Regular				
11	Location of teaching the course:	Faculty of medical and health sciences, Al-Saeed University				

VIII. Course Description:

This course is aimed to provide the student with the essential knowledge about the development and the application of biotechnology in pharmacy, including genetic dogma, the development of novel products, such as drugs hormones and vaccines. This course also discusses gene therapy and genetic basis of variability in drug response that contribute to drug efficacy and toxicity, adverse drug reactions and drug-gene interaction derived diagnostic aids/tests.

IX. Intended learning outcomes (ILOs) of the course:

Brief summary of the knowledge or skill the course is intended to develop:
Describe the composition and technology of biopharmaceutical drug production and development and use of the gene therapy.
Explain (by giving examples) the components of, and challenges in development of biological and drugs in pharmaceutical and biotechnology industry.
Describe how human genetic variability can impact drug action.
Predict how the differences in gene composition may affect the composition of products coded by this gens.
Analyze how human genetic variability can impact drug action.
Give the patients advice and reasons about differences in their responses to the same medications.
Assess the requirements of research and resources of Information related to biotechnology and pharmacogenomics.

X. Course Content:

- Distribution of Semester Weekly Plan of Course Topics/Items and Activities.

A – Theoretical Aspect:

Order	Topics List	Week Due	Contact Hours
1	**Introduction** - Biotechnology; definitions and importance. - Nucleic acids and gens definitions, compositions. - DNA duplication, transcription and translation. - Protein synthesis and structure.	1st, 2nd	4
2	- Fermentation	3rd	2
3	- PCR - Recombinant DNA technology. - Production of hormones and other products using recombinant DNA technology	4th, 5th	4
4	- Monoclonal antibodies production - Gene therapy	6th	2
5	- Vaccines technology	7th	2
6	**Midterm Exam**	8th	2
7	- Introduction into pharmacogenomics (definitions and meaning) - Genetic polymorphism in pharmacology	9th	2

8	- Undesirable effects and pharmacogenetics	10th	2
9	- Genetic polymorphism of receptors	11th	2
10	- Drug metabolism and genetic diversity	12th	2
11	- Selected diseases and examples of changed body response to drugs	13th	2
12	- Genetic tests in pharmacogenetics	14th	2
13	- Revision	15th	2
14	- **Final Exam**	16th	2
Number of Weeks /and Units Per Semester			

XI. Teaching strategies of the course:

Lecture, Problem- solving exercises,

Homework, Tutorials, seminars

XII. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Homework	a1, a2, a3,b1, b2, c1	12th	5
2	Tutorial	a1, a2, a3,b1, b2, c1,d1	14th	5
3	Midterm	a1, a2, a3,b1, b2, c1,d1	8th	20
	Final Exam	a1, a2, a3,b1, b2, c1,d1	16th	70

XIII. Schedule of Assessment Tasks for Students During the Semester:

Assessment	Type of Assessment Tasks	Week Due	Mark	Proportion of Final Assessment
1	Homework	12th	5	5%
2	Tutorial	14th	5	5%
3	Midterm	8th	20	20%

4	Final Exam	16th	70	70%

XIV. Learning Resources:

- Written in the following order: (Author – Year of publication – Title – Edition – Place of publication – Publisher).

1- Required Textbook(s) (maximum two).

1- Biotechnology and Biopharmaceuticals: Transforming Proteins and Genes into Drugs, Rodney J.Y. Ho, Milo Gibaldi (John Wiley & Sons, Ltd. Hoboken, New Jersey, USA, 2003)

2- Essential References.

1- Pharmaceutical Microbiology, Hugo Russell, , Sixth edition, Blackwell Science, (2005).

3- Electronic Materials and Web Sites *etc*.

1
2-

XV. Course Policies:

1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2	**Tardy:** - Any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - Any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** - Assignments and projects will be assessed individually unless the teacher request for group work
5	**Cheating:** - Cheating by any means will cause the student failure and he/she must re-study the course
6	**Plagiarism:** - Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:**

Course Specification of Pharmacokinetics

I. Course Identification and General Information:

1	**Course Title:**	**Pharmacokinetics**				
2	**Course Code & Number:**	**PHA457**				
3	**Credit hours:**	C.H				Total
		Th.	Seminar	practical	Training.	
		2				**2**
4	**Study level/ semester at which this course is offered:**	**4th level/ 1ST semester**				
5	**Pre –requisite (if any):**	Biopharmaceutics				
6	**Co –requisite (if any):**	**none**				
7	**Program (s) in which the course is offered:**	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	**Language of teaching the course:**	**English**				
9	**Study System**	**Semester**				
10	**Mode of delivery:**	**Regular**				
11	**Location of teaching the course:**	**Al-Saeed University campus**				
12	**Prepared By:**	**Dr. Abdulkarim Kassem Alzomor**				

II. Course Description:

In this course the students study the types of models, order of kinetics and methods of calculation the rate of changes in the drug's absorption, distribution and elimination with time following one and two compartment I.V bolus, oral and I.V infusion.
Also, the students will study the principles of the linear and non-linear pharmacokinetic models and their application.

III. Course Objectives:
This course aims to: 1- Provide the students with different methods to calculate pharmacokinetics parameters. 2- Acquire the student's skills for using semi log and coordinate paper to calculate pharmacokinetics parameters. 3- Explain the major differences between zero and first order kinetics and also, linear and non-linear pharmacokinetic

IV.	Course Intended learning outcomes (CILOs) of the course	WRITE Symbol and number of PILOs
a.1	Explain pharmacokinetics orders, models. and parameters.	**A2, A3**
a.2	Identify the pharmacokinetics properties of different pharmaceutical dosage forms including in-vivo or in-vitro study.	**A2, A3**
b.1	Interpret the pharmacokinetics parameters results for different pharmaceutical dosage form.	**B2, B3**
b.2	Predicts the pharmacokinetics parameters by applying pharmaceutical applications.	**B1**
c.1	Employ developing instruments to measure drugs bioavailability parameters.	**C1**
c.2	Calculate precise the pharmacokinetic parameters and the dosage regimen.	**C2, C4**
d.1	Perform tasks and costs of the course independently and be able to work as an effective member in a team.	**D1**
d.2	Develop his skills in the field of pharmacokinetics and manage time effectively	**D1**

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1. Explain pharmacokinetics orders, models. and parameters.	Lectures and Exercises.	Quizzes, Written exam.

a2. Identify the pharmacokinetics properties of different pharmaceutical dosage forms including in-vivo or in-vitro study.		

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1. Interpret the pharmacokinetics parameters results for different pharmaceutical dosage form.	- Lectures, Discussions and Exercises. - Brain Storming.	Quizzes, Homework
b2. Predicts the pharmacokinetics parameters by applying pharmaceutical applications.		

(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1. Calculate precise the pharmacokinetic parameters and the dosage regimen.	- Lectures, Exercises. - Simulation	Report and Solve problems
c2. Employ developing instruments to measure drugs bioavailability parameters.		

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1. Perform tasks and costs of the course independently and be able to work as an effective member in a team.	- Group discussions - Self-learning - Cooperative learning	Homework
d2. Develop his skills in the field of pharmacokinetics and manage time effectively		

V. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	contact hours
1	Introduction to pharmacokinetics	a1, c1, d2	• Terminology and definitions • Models define, Important and classification • Compartment model • Definition • Basis of Classification and types • Model selection criteria	1	2
2	Fundamentals Mathematical calculation	a1, b2, c1, d2	• Exponent • Logarithm • Derivatives and integration • Trapezoidal law • Calculation Area Under the curve • Types of graves and paper • Line equation • Slope and intercept	1	2
3	Order of pharmacokinetics	a1,a2, b2, c1, d1. d2	• Zero order pharmacokinetics • Define • Equation • Parameters and units • First order pharmacokinetics • Define • Equation • Parameters and units • Problems	1	2
4	One compartment open model IV bolus	a1, a2, b1, b2, c1, d1. d2	• One Compartment I.V Bolus • First-order kinetics • Volume of Distribution • Plasma data • Area under the Curve • Half-life	1	2

			• Duration of action • Elimination Rate Constant • Clearance		
5	One compartment open model Urine excretion	a1, a2, b2.c1, d1. d2	• Methods of calculations drug parameters from urine: Rate Method and Sigma Minus Method: • Differences between the two method • Problems must be considered when calculation drugs parameters from urine • Parameters determine from rate method: • Elimination Rate Constant (K) • Excretion Rate Constant (Ke) • Metabolism Rate Constant (Km) • Half-life • Volume of Distribution • Clearance • Area under the Curve • Parameters determine from sigma minus method: • Elimination Rate Constant (K) • Half-life • Volume of Distribution • Clearance • Area under the Curve • Problems.	2	4
6	Mid-term Exam			1	2
7	Two and three compartment first order elimination kinetics	a1, a2, b1,b2,c1, d1, d2	• Two compartments (Distribution phase and Elimination phase) • Residual Method: to determine • Intercept and rate for elimination phase (B & b) • Intercept and rate for distribution phase (A& a) • Pharmacokinetics	2	4

			parameters calculate from two compartment: • K, K12, K21 • Plasma volume distribution (Vp) • Tissue volume distribution (Vt) • Problems		
8	Pharmacokinetics for oral drug absorption	a2, a2, b1,b2, c1,c2, d1, d2	• Pharmacokinetics of Oral drug absorption • Zero order drug absorption: • Equation • First order drug absorption: • Equation for calculation drug absorption from plasma or urine. • Bioavailability parameters: • Equation for calculation time to reach drug maximum peak (Tmax). • Calculation maximum concentration for drug absorption (Cmax). • Methods for determination absorption rate constant (Ka) • Residual method • Flip flop Method • Wagner nelson • Problems	2	4
9	Pharmacokinetics for Intravenous infusion drug absorption	a1,a2 c1, , d1, d2	• Intravenous Infusion: one compartment • Zero order absorb and first order eliminate (equation) • Continuous infusion – steady state • Combined infusion and bolus administration (Loading Dose) • Combined slow and fast infusion • Intravenous Infusion: Two compartment • Problems	1	2

10	Non-linear pharmacokinetics (dose dependent kinetics)	a1,a2,b1, c1,c2, d1, d2	• Michaels- Menten's kinetics • Pharmacokinetic characteristics. • In-vivo estimation of Km and Vm • Problems	1	2
11	Multiple dose Administration	a1,a2,b1, c1,c2, d1, d2	• Multiple I.V Bolus Dose • Independent doses • Accumulating doses • Development of general equation • Cpmax and Cpmin equations • Multiple Oral Dose Administration: • Cpmin equation • Average Cp equation • Problems	1	2
12	Dosage regimen design	a1,a2,b1, c1,c2, d1, d2	• Calculation the dose • Calculation dosing interval • Average concentration • Problems	1	2
13	FINAL - EXAM			1	2
Number of Weeks /and Units Per Semester				**16**	**32**

VI. Teaching strategies of the course:

- Lectures, Discussions and Exercises.
- Group discussions
- Brain Storming.
- Simulation
- Self-learning
- Cooperative learning

VII. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Participation and solve problems	a1, a2, c1, c2, d1, d2.	weekly	5
2	Exercises and home work	a1, b1, b2, c1, c2, d1, d2	weekly	5

VIII. Schedule of Assessment Tasks for Students During the Semester:					
No.	**Assessment Method**	**Week Due**	**Mark**	**Proportion of Final Assessment**	**Aligned Course Learning Outcomes**
1	Assignments	1-14	10	10%	a1, a2, b1, b2, c1, c2, d1, d2
3	Mid-semester exam of theoretical part (written exam	7	20	20%	a1, a2, c1, b1
5	Final exam of theoretical part (written exam)	16	70	70%	a1, a2, b1, b2, c1, c2, d1, d2
Total			100	100%	

IX. Learning Resources:	
1- Required Textbook(s) (maximum two).	
	3. Curtis L . Smith, Pharm.D., FCCP, BCPS (2018). Pharmacokinetics , Ferris State University Lansing, Michigan. 4. Leon Shargel Andrew (2012). Applied Biopharmaceuticsand Pharmacokinetics, Sixth edition, Lippincotts and William, Philadelphia.
2- Essential References.	
	3. Michel E. Winter (2011). Basic clinical pharmacokinetics, Fifth edition, Lippincotts and William, San Fransisco. 4. V. Venkateswarlu 2008) .Biopharmaceutics and Pharmacokinetics, PharmaMed Press ISBN: ·81-88449-51-2.
3- Electronic Materials and Web Sites *etc.*	
	2. www.boomer.org

X. Course Policies:	
1	**Class Attendance:**

	- At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** - Assignments and projects will be assessed individually unless the teacher request for group work
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:** -

Template for Course Plan (Syllabus) of Pharmacokinetics

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		**Office Hours**					
Location& Telephone No.		**SAT**	**SUN**	**MON**	**TUE**	**WED**	**THU**
E-mail							

II. Course Identification and General Information:						
1	**Course Title:**	**Pharmacokinetics**				
2	**Course Code & Number:**	**PHA457**				
3	**Credit hours:**	C.H				Total
		Th.	Seminar	practical	Training.	
		2				**2**
4	**Study level/ semester at which this course is offered:**	**4th level/ 1st semester**				
5	**Pre –requisite (if any):**	Biopharmaceutics				
6	**Co –requisite (if any):**	**none**				
7	**Program (s) in which the course is offered:**	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	**Language of teaching the course:**	**English**				
9	**Study System**	**Semester**				
10	**Mode of delivery:**	**Regular**				
11	**Location of teaching the course:**	**Al-Saeed University campus**				
12	**Prepared By:**	**Dr. Abdulkarim Kassem Alzomor**				

III. Course Description:

In this course the students study the types of models, order of kinetics and methods of calculation the rate of changes in the drug's absorption, distribution and elimination with time following one and two compartment I.V bolus, oral and I.V infusion.

Also, the students will study the principles of the linear and non-linear pharmacokinetic models and their application.

IV. Course Objectives:

This course aims to:

1. Provide the students with different methods to calculate pharmacokinetics parameters.
2. Acquire the student's skills for using semi log and coordinate paper to calculate pharmacokinetics parameters.
3. Explain the major differences between zero and first order kinetics and also, linear and non-linear pharmacokinetic

V. Intended learning outcomes (ILOs) of the course:

1. Explain pharmacokinetics orders, models. and parameters
2. Identify the pharmacokinetics properties of different pharmaceutical dosage forms including in-vivo or in-vitro study.
3. Interpret the pharmacokinetics parameters results for different pharmaceutical dosage form.
4. Predicts the pharmacokinetics parameters by applying pharmaceutical applications.
5. Employ developing instruments to measure drugs bioavailability parameters.
6. Calculate precise the pharmacokinetic parameters and the dosage regimen.
7. Perform tasks and cost of the course independently and be able to work as an effective member in a team.
8. Develop his skills in the field of pharmacokinetics and manage time effectively

VI. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Sub Topics List	Week Due	contact hours
1	Introduction to pharmacokinetics	• Terminology and definitions • Models define, Important and classification • Compartment model • Definition	W1	2

		• Basis of Classification and types • Model selection criteria		
2	Fundamentals Mathematical calculation	• Exponent • Logarithm • Derivatives and integration • Trapezoidal law • Calculation Area Under the curve • Types of graves and paper • Line equation • Slope and intercept	W2	2
3	Order of pharmacokinetics	• Zero order pharmacokinetics • Define • Equation • Parameters and units • First order pharmacokinetics • Define • Equation • Parameters and units • Problems	W3	2
4	One compartment open model IV bolus	• One Compartment I.V Bolus • First-order kinetics • Volume of Distribution • Plasma data • Area under the Curve • Half-life • Duration of action • Elimination Rate Constant • Clearance	W4	2
5	One compartment open model Urine excretion	• Methods of calculations drug parameters from urine: Rate Method and Sigma Minus Method: • Differences between the two method • Problems must be considered when calculation drugs parameters from urine • Parameters determine from rate method: • Elimination Rate Constant (K)	W5 & W6	4

		• Excretion Rate Constant (Ke) • Metabolism Rate Constant (Km) • Half-life • Volume of Distribution • Clearance • Area under the Curve • Parameters determine from sigma minus method: • Elimination Rate Constant (K) • Half-life • Volume of Distribution • Clearance • Area under the Curve • Problems.		
6	Mid-term Exam		W7	2
7	Two and three compartment first order elimination kinetics	• Two compartments (Distribution phase and Elimination phase) • Residual Method: to determine • Intercept and rate for elimination phase (B & b) • Intercept and rate for distribution phase (A& a) • Pharmacokinetics parameters calculate from two compartment: • K, K12, K21 • Plasma volume distribution (Vp) • Tissue volume distribution (Vt) • Problems	W8 & W9	4
8	Pharmacokinetics for oral drug absorption	• Pharmacokinetics of Oral drug absorption • Zero order drug absorption: • Equation • First order drug absorption: • Equation for calculation drug absorption from plasma or urine. • Bioavailability parameters: • Equation for calculation time to reach drug maximum peak (Tmax). • Calculation maximum concentration for drug	W10 & W11	4

		absorption (Cmax). • Methods for determination absorption rate constant (Ka) • Residual method • Flip flop Method • Wagner nelson • Problems		
9	Pharmacokinetics for Intravenous infusion drug absorption	• Intravenous Infusion: one compartment • Zero order absorb and first order eliminate (equation) • Continuous infusion – steady state • Combined infusion and bolus administration (Loading Dose) • Combined slow and fast infusion • Intravenous Infusion: Two compartment • Problems	W12	2
10	Non-linear pharmacokinetics (dose dependent kinetics)	• Michaels- Menten's kinetics • Pharmacokinetic characteristics. • In-vivo estimation of Km and Vm • Problems	W13	2
11	Multiple dose Administration	• Multiple I.V Bolus Dose • Independent doses • Accumulating doses • Development of general equation • Cpmax and Cpmin equations • Multiple Oral Dose Administration: • Cpmin equation • Average Cp equation • Problems	W14	2

12	Dosage regimen design	• Calculation the dose • Calculation dosing interval • Average concentration • Problems	W15	2
13		FINAL - EXAM	W16	2
Number of Weeks /and Units Per Semester			**16**	**32**

VII. Teaching strategies of the course:

- Lectures, Discussions and Exercises.
- Group discussions
- Brain Storming.
- Simulation
- Self-learning
- Cooperative learning

VIII. Assignments:

No	Assignments	Week Due	Mark
1	Participation and solve problems	weekly	5
2	Exercises and home work	weekly	5

IX. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment
1	Assignments	1-14	10	10%
3	Mid-semester exam of theoretical part (written exam)	7	20	20%
5	Final exam of theoretical part (written exam)	16	70	70%
Total			100	100%

X. Learning Resources:	
1- Required Textbook(s) (maximum two).	
	1. Curtis L . Smith, Pharm.D., FCCP, BCPS (2018). Pharmacokinetics , Ferris State University Lansing, Michigan. 2. Leon Shargel Andrew (2012). Applied Biopharmaceuticsand Pharmacokinetics, Sixth edition, Lippincotts and William, Philadelphia.
2- Essential References.	
	1. Michel E. Winter (2011). Basic clinical pharmacokinetics, Fifth edition, Lippincotts and William, San Fransisco. 2. V. Venkateswarlu 2008) .Biopharmaceutics and Pharmacokinetics, PharmaMed Press ISBN: ·81-88449-51-2.
3- Electronic Materials and Web Sites *etc.*	
	1. www.boomer.org

	XI. Course Policies:
1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam.
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** - Assignments and projects will be assessed individually unless the teacher request for group work.
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course.
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the faculty rules.

Course Specification of Pharmacology (3)

I. Course Identification and General Information:

1	Course Title:	Pharmacology (3)				
2	Course Code & Number:	PHA463				
3	Credit hours:	C.H				TOTAL
		Th.	Seminar	practical	Training.	
		2				2
4	Study level/ semester at which this course is offered:	Fourth level, first semester				
5	Pre –requisite (if any):	Pharmacology (2)				
6	Co –requisite (if any):	None				
7	Program (s) in which the course is offered:	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	Language of teaching the course:	English Language				
9	Study System	Semester				
10	Mode of delivery:	Regular				
11	Location of teaching the course:	University				
12	Prepared By:	Dr. Hamad Mahmood Alshabi				

II. Course Description:

This course covers the pharmacology of drugs acting on the central nervous system (CNS) and endocrine system. This course includes drugs' mechanism of action, pharmacokinetics, clinically significant side effects & drug interactions, contraindications, misuse, abuse of drugs, and clinical uses.

III. Course Objectives:

1- Students should be able to mention accurately the actions and uses of a number of pharmacologically active drug classes
2- Students should be able to explain efficiently the mechanisms by which different members of each class act on their target receptors.
3- Students should be able to discuss professionally pharmacokinetics and adverse effects of individual drugs.
4- Students should be able to discuss human body control and the activity of hormones and diseases resulting from excess or deficiency of hormones.

IV. **Course Intended learning outcomes (CILOs) of the course:** Upon successful completion of this course, the student should be able to:		WRITE Symbol and number of PILOs
a.1	Recognize the pathophysiology of major diseases affecting the central nervous system and endocrine system.	**A1**
a.2	Identify the pharmacological properties (action, mechanisms of action, therapeutic uses, dosage, contraindications, ADRs and drug interactions, toxicity, and misuse or abuse of the drugs acting on the central nervous system (CNS) and endocrine system.	**A3**
b.1	Differentiate between the major drug classes and between members of each drug class in relation to their mechanism of action, pharmacokinetic parameters and adverse effects.	**B1**
b.2	Select optimum therapeutic agents based on their binding sites, molecular mechanism of action and pharmacokinetic parameters.	**B3**
c.1	Recommend the most appropriate therapy that eliminates drug interaction and reduces side effects.	**C2**
c.2	Advise patients and other health professionals on proper use of medicines and their possible adverse effects.	**C4**
d.1	Demonstrate critical thinking, decision making, team working, life long learning and communication skills.	**D1, D2**
d.2	Utilize different resources of pharmacology (books, professional sites and scientific journals) to get information about the drugs.	**D3**

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1- Recognize the pathophysiology of major diseases affecting the central nervous system and endocrine system.	- Interactive Lectures - Case-Study - Assignments - Self-Learning	- Written Exams (midterm and final) - Multiple Choice Questions (MCQs) - Assignments **&** Coursework Activities
a2- Identify the pharmacological		

properties (action, mechanisms of action, therapeutic uses, dosage, contraindications, ADRs and drug interactions, toxicity, and misuse or abuse of the drugs acting on the central nervous system (CNS) and endocrine system.		- Quizzes

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	**Teaching strategies**	**Assessment Strategies**
b1- Differentiate between the major drug classes and between members of each drug class in relation to their mechanism of action, pharmacokinetic parameters and adverse effects.	- Interactive Lectures - Case-Study - Assignments - Problem-based Learning - Simulation	- Written Exams (midterm and final) - Multiple Choice Questions (MCQs) - Assignments **&** Coursework Activities - Quizzes - Problem Solving Exercise
b2- Select optimum therapeutic agents based on their binding sites, molecular mechanism of action and pharmacokinetic parameters.		

(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	**Teaching strategies**	**Assessment Strategies**
c1- Recommend the most appropriate therapy that eliminates drug interaction and reduces side effects.	- Case-Study - Assignments - Problem-based Learning - Simulation	- Multiple Choice Questions (MCQs) - Assignments **&** Coursework Activities - Problem Solving Exercise
c2- Advise patients and other health professionals on proper use of medicines and their possible adverse effects.		

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	**Teaching strategies**	**Assessment Strategies**
d1- Demonstrate critical thinking, decision making, team working, life long learning and communication skills.	- Case-Study - Assignments - Problem-based Learning - Simulation - Cooperative learning	- Assignments **&** Coursework Activities - Problem Solving Exercise - Report of Assignments - Oral Presentation
d2- Utilize different resources of pharmacology (books, professional sites and scientific journals) to get information about the drugs.		

V. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	contact hours
1	**DRUGS ACTING ON CENTRAL NERVOUS SYSTEM**	a1, a2, b1, b2, c1, c2, d1, d2	- Introduction to the pharmacology of CNS. - Hypnotic, Sedative and anxiolytic drugs. - Pharmacologic Management of Parkinsonism & Other Movement Disorders. - Antiseizure Drugs. - Antipsychotic Agents & Lithium. - Antidepressant Agents.	6	12
2		a1, a2, b1, b2, c1, c2	**Mid-term Exam**	1	2
3		a1, a2, b1, b2, c1, c2, d1, d2	- Opioid Agonists & Antagonists. - General anaesthetics and local anaesthetics. CNS stimulants.	2	4
4	**ENDOCRINE DRUGS**	a1, a2, b1, b2, c1, c2,	- Hypothalamic & Pituitary Hormones. - Thyroid & Antithyroid	6	12

		d1, d2	Drugs - Adrenocorticosteroids & Adrenocortical Antagonists - The gonadal hormones & inhibitors: estrogens, progestins, androgens, their inhibitors & antagonists and Drugs used for contraception. - Pancreatic Hormones & Antidiabetic Drugs - Agents That Affect Bone Mineral Homeostasis.		
5		a1, a2, b1, b2, c1, c2	**Final Term exam**	**1**	**2**
			Number of Weeks /and Units Per Semester	**16**	**32**

VI. Teaching strategies of the course:

- Interactive Lectures
- Case-Study
- Assignments
- Self-Learning
- Problem-based Learning
- Simulation
- Cooperative learning

VII. Assignments:

No	Assignments	Aligned CILOs (symbols)	Week Due	Mark
1	Participation, Homework Assignments	**a1, a2, b, b2, c1, c2, d1, d2**	Weekly	**3**
2	Exercises, Reports	**b, b2, c1, c2, d1, d2**	Weekly	**3**
	Total Score			**6**

VIII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes

1	Tasks and Assignments	1-14	**6**	**6%**	a1, a2, b, b2, c1, c2, d1, d2
2	Quizzes 1	**W6**	2	2%	a1, a2, b1, b2
3	Mid-term exam	**W7**	20	20%	a1, a2, b1, b2, c1, c2
4	Quizzes 2	**W12**	2	2%	a1, a2, b1, b2
5	Final exam	**W16**	70	70%	a1, a2, b1, b2, c1, c2
6	**Total**		100	100%	

IX. Learning Resources:

1- Required Textbook(s) (maximum two).

1- Katzung, B.G., (2018). Basic & Clinical Pharmacology, 14th edition, the Mc Grow Hill Companies.
2- Lippincott's illustrated reviews, 2019, Pharmacology, 7th edition, Wolters Kluwer.

2- Essential References.

1- James M. Ritter , Rod J. Flower, 2020, Rang and Dale Pharmacology. 9th edition, Churchill Livingstone Elsevier.
2- **Laurence L. Brunton,** 2018. Goodman and Gillman's Pharmacological Basis of Therapeuti 13th edition, McGraw-Hill Education.

3- Electronic Materials and Web Sites *etc.*

1- Website: Pharmacology Animation Book, http://animationbook.net
2- www.pharmacology2000.com/learning2.htm
3- www.pharmacology.com

X. Course Policies:

1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed

	to attend the exam and will be considered absent.
4	**Assignments & Projects**: - Assignments and projects will be assessed individually unless the teacher request for group work
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the faculty rules.
7	**Other policies**: -

Template for Course Plan (Syllabus) of Pharmacology (3)

I. - Information about Faculty Member Responsible for the Course:

		Office Hours					
Name of Faculty Member							
Location& Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Identification and General Information:

1	Course Title:	Pharmacology (3)				
2	Course Code & Number:	PHA463				
3	Credit hours:	C.H				TOTAL
		Th.	Seminar	practical	Training.	
		2				2
4	Study level/ semester at which this course is offered:	Fourth level, first semester				
5	Pre –requisite (if any):	Pharmacology (2)				
6	Co –requisite (if any):	None				
7	Program (s) in which the course is offered:	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	Language of teaching the course:	English Language				
9	Study System	Semester				
10	Mode of delivery:	Regular				
11	Location of teaching the course:	University				

III. Course Description:

This course covers the pharmacology of drugs acting on the central nervous system (CNS) and endocrine system. This course includes drugs' mechanism of action, pharmacokinetics, clinically significant side effects & drug interactions, contraindications, misuse, abuse of drugs, and clinical uses.

IV. Course Objectives:

1- Students should be able to mention accurately the actions and uses of a number of pharmacologically active drug classes
2- Students should be able to explain efficiently the mechanisms by which different members of each class act on their target receptors.
3- Students should be able to discuss professionally pharmacokinetics and adverse effects of individual drugs.
4- Students should be able to discuss human body control and the activity of hormones and diseases resulting from excess or deficiency of hormones.

V. Intended learning outcomes (ILOs) of the course:

Upon successful completion of this course, the student should be able to:

1- Recognize the pathophysiology of major diseases affecting the central nervous system and endocrine system .
2- Identify the Pharmacological properties (action, mechanisms of action, therapeutic uses, dosage, contraindications, ADRs and drug interactions, toxicity, and misuse or abuse of the drugs acting on the central nervous system (CNS) and endocrine system.
3- Differentiate between the major drug classes and between members of each drug class in relation to their mechanism of action, pharmacokinetic parameters and adverse effects.
4- Select optimum therapeutic agents based on their binding sites, molecular mechanism of action and pharmacokinetic parameters.
5- Recommend the most appropriate therapy that eliminates drug interaction and reduces side effects.
6- Advise patients and other health professionals on proper use of medicines and their possible adverse effects.
7- Demonstrate critical thinking, decision making, team working, life long learning and communication skills.
8- Utilize different resources of pharmacology (books, professional sites and scientific journals) to get information about the drugs.

VI. Course Content:

A – Theoretical Aspect:

Order	Topics List	Week Due	Contact Hours
1	**DRUGS ACTING ON CENTRAL NERVOUS SYSTEM** **1-** Introduction to the pharmacology of CNS.	1	2
2	2- Hypnotic, Sedative and anxiolytic drugs.	2	2
3	3- Pharmacologic Management of Parkinsonism & Other Movement Disorders.	3	2
4	4- Antiseizure Drugs.	4	2
5	5- Antipsychotic Agents & Lithium.	5	2
6	6- Antidepressant Agents.	6	2
7	**Mid-term Exam**	7	2
8	7- Opioid Agonists & Antagonists. 8- General anaesthetics and local anaesthetics. CNS stimulants.	8, 9	4
9	**ENDOCRINE DRUGS** 1- Hypothalamic & Pituitary Hormones. 2- Thyroid & Antithyroid Drugs.	10	2
10	3- Adrenocorticosteroids & Adrenocortical Antagonists	11	2
11	4- The gonadal hormones & inhibitors: estrogens, progestins, androgens, their inhibitors & antagonists and Drugs used for contraception.	12	2
12	5- Pancreatic Hormones & Antidiabetic Drugs.	13, 14	4
13	6- Agents That Affect Bone Mineral Homeostasis.	15	2
14	**Final Term exam**	16	2
Number of Weeks /and Units Per Semester		**16**	**32**

VII. Teaching strategies of the course:

- Interactive Lectures
- Case-Study
- Assignments
- Self-Learning
- Problem-based Learning
- Simulation
- Cooperative learning

VIII. Assignments:

No	Assignments	Week Due	Mark
1	Participation, Homework Assignments	Weekly	**3**
2	Exercises, Reports	Weekly	**3**
	Total Score		**6**

IX. Schedule of Assessment Tasks for Students During the Semester:

Assessment	Type of Assessment Tasks	Week Due	Mark	Proportion of Final Assessment
1	Tasks and Assignments	1-14	**6**	**6**%
2	Quizzes 1	**W6**	2	2%
3	Mid-term exam	**W7**	20	20%
4	Quizzes 2	**W12**	2	2%
5	Final exam	**W16**	70	70%
6	**Total**		100	100%

X. earning Resources:

1- Required Textbook(s) (maximum two).

1- Katzung, B.G., (2018). Basic & Clinical Pharmacology, 14th edition, the Mc Grow Hill Companies.
2- Lippincott's illustrated reviews, 2019, Pharmacology, 7th edition, Wolters Kluwer.

2- Essential References.

1- James M. Ritter , Rod J. Flower, 2020, Rang and Dale Pharmacology. 9th edition, Churchill Livingstone Elsevier.

2- **Laurence L. Brunton,** 2018. Goodman and Gillman's Pharmacological Basis of Therapeutics: 13th edition, McGraw-Hill Education.
3- Electronic Materials and Web Sites *etc.*
1- Website: Pharmacology Animation Book, http://animationbook.net 2- www.pharmacology2000.com/learning2.htm 3- www.pharmacology.com

XI. Course Policies:

1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam.
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** - Assignments and projects will be assessed individually unless the teacher request for group work.
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course.
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:**

Course Specification of Drug Information

I. Course Identification and General Information:

1	Course Title:	Drug Information				
2	Course Code & Number:	PHA464				
3	Credit hours:	C.H				TOTAL
		Th.	Seminar	practical	Training.	
		1				1
4	Study level/ semester at which this course is offered:	Fourth level/first semester				
5	Pre –requisite (if any):	Pharmacology (2)				
6	Co –requisite (if any):	Pharmacology (3)				
7	Program (s) in which the course is offered:	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	Language of teaching the course:	English Language				
9	Study System	Semester				
10	Mode of delivery:	Regular				
11	Location of teaching the course:	University				
12	Prepared By:					

III. Course Description:

This course introduces students to the concept and need of drug information, drug information center (DIC), types of drug information resources with evaluation for each and application of drug information skills for the delivery of pharmaceutical care.

IV. Course Objectives:

1- To describe the basic concepts of drug information, drug information center (DIC) and the role of pharmacist as drug information provider in health care.
2- To describe and perform an evaluation of a drug product for drug formulary.
3- To recognize the types of drug information resources with evaluation for each.
4- To demonstrate the abilities to formulate an effective response to drug information (DI) questions.

V.	Course Intended learning outcomes (CILOs) of the course	WRITE Symbol and number of PILOs
a.1	Demonstrates sound knowledge and understanding of the concepts of drug information, types of drug information resources, drug information center and drug evaluation monographs.	**A5**
a.2	Describe the role of pharmacist as a drug information provider.	**A4**
b.1	Formulate an effective response to drug information request using a systematic approach.	**B3**
b.2	Integrate the concept of drug information with the knowledge of pharmacy related sciences in the evaluation of a drug product for drug formulary.	**B4**
c.1	Select the most appropriate resources for a specific drug information request.	**C2, C4**
d.1	Demonstrates the abilities to provide an accurate drug information in both written and oral forms by using the most appropriate drug information resources.	**D1, D3**

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1. Demonstrates sound knowledge and understanding of the concepts of drug information, types of drug information resources, drug information center and drug evaluation monographs.	- Interactive Lectures - Self-Learning - Assignments - Computer aided learning	- Written Exams (midterm and final) - Quizzes - Assignments & Coursework Activities - Multiple Choice Questions (MCQs)
a2. Describe the role of pharmacist as a drug information provider.		

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1. Formulate an effective response to drug information request using a systematic approach.	- Interactive Lectures - Self-Learning - Assignments - Computer aided learning - Case-Study	- Written Exams (midterm and final) - Quizzes - Assignments & Coursework Activities - Multiple Choice Questions (MCQs)
b2. Integrate the concept of drug information with the knowledge of pharmacy related sciences in the evaluation of a drug product for drug formulary.		

(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1- Select the most appropriate resources for a specific drug information request.	- Case-Study - Assignments - Problem-based Learning - Computer aided learning	- Multiple Choice Questions (MCQs) - Assignments & Coursework Activities - Problem Solving Exercise

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1- Demonstrates the abilities to provide an accurate drug information in both written and oral forms by using the most appropriate drug information resources.	- Case-Study - Self-Learning - Assignments - Cooperative learning	- Oral Presentation & Seminar Assessment - Assignments & Coursework Activities

VI. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	contact hours
1	**Introduction to the concept of drug information**	**a1, a2, b2, d1**	- Concepts and Terminology - Role of pharmacist as medication expert in health care - Drug information services - Drug information skills	2	2
2	**Drug information center (DIC)**	**a1, b2, d1**	- Definition - Needs of DIC - Objectives - Design of DIC	2	2
3	**Formulating an effective response: structured approach**	**a1, b1, c1, d1**	- Introduction - Steps for answering a questions - Formulating the response	2	2
4	**Mid-term exam**	**a1, a2, b1, b2, c1, d1**	**Mid-term exam**	1	1
5	**Drug Information Resources**	**a1, b1, b2, c1, d1**	- Primary resources	2	2
	Drug Information Resources	**a1, b1, b2, c1, d1**	- Secondary resources	2	2
	Drug Information Resources	**a1, b1, b2, c1, d1**	- Tertiary resources	2	2

	Drug evaluation monographs	**a1, b2, c1, d1**	- Purpose - Sources - Contents - Importance - Preparation	2	2
	Final term exam	**a1, a2, b1, b2, c1, d1**		1	1
Number of Weeks /and Units Per Semester				**16**	**16**

VII. Teaching strategies of the course:

- Interactive Lectures
- Self-Learning
- Assignments
- Computer aided learning
- Case-Study
- Problem-based Learning
- Cooperative learning

VIII. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Participation, Homework Assignments	**a1, b1, b2, c1, d1**	Weekly	**2.5**
2	Exercises	**b1, b2, c1, d1**	Weekly	**2.5**
	Total			**5**

IX. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Tasks and Assignments	**1-14**	**5**	5%	**a1, b1, b2, c1, d1**
2	Quizzes 1	**W6**	2.5	2.5%	**a1, a2, b2, d1**
3	Mid-term exam	**W7**	20	20%	**a1, a2, b1, b2, c1, d1**
4	Quizzes 2	**W12**	2.5	2.5%	**a1, a2, b2, d1**

5	Final exam	**W16**	70	70	**a1, a2, b1, b2, c1, d1**
	Total		**100**	**100%**	

X. Learning Resources:

1- Required Textbook(s) (maximum two).

1- Malone, PM. Malone M.J. and Park, S.K. 2019. Drug information: a guide for pharmacists. 6th edition. McGraw-Hill, Medical Pub. Division.
2- Thomas, D. (editor). 2019. Clinical pharmacy education, practice and research. Elsevier Inc.

2- Essential References.

1- Gabay, M. 2016. The clinical practice of drug information. Jones & Bartlett learning, LL
2- Drug information services: guidelines. Ottawa. ON. Canadian society of hospital pharmacists. 2015.

3- Electronic Materials and Web Sites *etc.*

1- www.lexicomp.com
2- www.pubmed.com
3- www.drugs.com
4- www.micromedex.com
5- www.Drugupdate.com

XI. Course Policies:

1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.

4	**Assignments & Projects:** Assignments and projects will be assessed individually unless the teacher request for group work
5	**Cheating**: Cheating by any means will cause the student failure and he/she must re-study the course
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:** -

Template for Course Plan (Syllabus) of Drug Information

I. - Information about Faculty Member Responsible for the Course:

Name of Faculty Member		Office Hours					
Location& Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Identification and General Information:

1-	Course Title:	Drug Information				
2-	Course Number & Code:	PHA464				
3-	Credit hours:	C.H				Total
		Th.	Seminar	Pr.	F. Tr.	
		1				1
4-	Study level/year at which this course is offered:	Fourth level/first semester				
5-	Pre –requisite (if any):	Pharmacology (2)				
6-	Co –requisite (if any):	Pharmacology (3)				
7-	Program (s) in which the course is offered	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8-	Language of teaching the course:	English Language				
9-	System of Study:	Semester				
10-	Mode of delivery:	Regular				
11-	Location of teaching the course:	University				

III. Course Description:

This course introduces students to the concept and need of drug information, drug information center (I types of drug information resources with evaluation for each and application of drug information skills the delivery of pharmaceutical care.

IV. Course Objectives:

1- To describe the basic concepts of drug information, drug information center (DIC) and the role of pharmacist as drug information provider in health care.
2- To describe and perform an evaluation of a drug product for drug formulary.
3- To recognize the types of drug information resources with evaluation for each.
4- To demonstrate the abilities to formulate an effective response to drug information (DI) questions.

V. Intended learning outcomes (ILOs) of the course:

- Brief summary of the knowledge or skill the course is intended to develop:

1- Demonstrates sound knowledge and understanding of the concepts of drug information, types of drug information resources, drug information center and drug evaluation monographs.
2- Describe the role of pharmacist as a drug information provider.
3- Formulate an effective response to drug information request using a systematic approach.
4- Integrate the concept of drug information with the knowledge of pharmacy related sciences in the evaluation of a drug product for drug formulary.
5- Select the most appropriate resources for a specific drug information request.
6- Demonstrates the abilities to provide an accurate drug information in both written and oral forms by using the most appropriate drug information resources.

VI. Course Content:

- Distribution of Semester Weekly Plan of Course Topics/Items and Activities.

A – Theoretical Aspect:

Order	Topics List	Week Due	Contact Hours
1	**Introduction to the concept of drug information:** - Concepts and Terminology - Role of pharmacist as medication expert in health care - Drug information services - Drug information skills	1st & 2nd	2
2	**Drug information center (DIC)** - Definition - Needs of DIC - Objectives - Design of DIC	3rd & 4th	2
3	**Formulating an effective response: structured approach** - Introduction - Steps for answering a questions - Formulating the response	5th & 6th	2
4	**Mid-term exam**	7th	1
5	**Drug Information Resources** Primary resources	8th & 9th	2
6	**Drug Information Resources** Secondary resources	10th & 11th	2
7	**Drug Information Resources** Tertiary resources	12th & 13th	2

8	**Drug evaluation monographs** - Purpose - Sources - Contents - Importance - Preparation	14th & 15th	2
9	**Final term exam**	16th	1
	Number of Weeks /and Units Per Semester	**16**	**16**

VII. Teaching strategies of the course:

- Interactive Lectures
- Self-Learning
- Assignments
- Computer aided learning
- Case-Study
- Problem-based Learning
- Cooperative learning

VIII. Assignments:

No	Assignments	Week Due	Mark
1	Participation, Homework Assignments	Weekly	**2.5**
2	Exercises	Weekly	**2.5**
3	Total		5

IX. Schedule of Assessment Tasks for Students During the Semester:

Assessment	Type of Assessment Tasks	Week Due	Mark	Proportion of Final Assessment
1	Tasks and Assignments	**1-14**	**5**	5%
2	Quizzes 1	**W6**	2.5	2.5%
3	Mid-term exam	**W7**	20	20%
4	Quizzes 2	**W12**	2.5	2.5%
5	Final exam	**W16**	70	70
	Total		**100**	**100%**

X. Learning Resources:

1- Required Textbook(s) (maximum two).

1- Malone, PM. Malone M.J. and Park, S.K. 2019. Drug information: a guide for pharmacists. 6th edition. McGraw-Hill, Medical Pub. Division.
2- Thomas, D. (editor). 2019. Clinical pharmacy education, practice and research. Elsevier Inc.

2- Essential References.

1- Gabay, M. 2016. The clinical practice of drug information. Jones & Bartlett learning, LLC.
2- Drug information services: guidelines. Ottawa. ON. Canadian society of hospital pharmacists. 2015.

3- Electronic Materials and Web Sites *etc*.

1- www.lexicomp.com
2- www.pubmed.com
3- www.drugs.com
4- www.micromedex.com
5- www.Drugupdate.com

XI. Course Policies:

1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** Assignments and projects will be assessed individually unless the teacher request for group work
5	**Cheating**: Cheating by any means will cause the student failure and he/she must re-study the course
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the faculty rules.

Course Specification of Phytotherapy

I. Course Identification and General Information:

1	Course Title:	Phytotherapy				
2	Course Code & Number:	PHA476				
3	Credit hours:	C.H				TOTAL
		Th.	Seminar	practical	Training.	
		2				2
4	Study level/ semester at which this course is offered:	Fourth level, first semester				
5	Pre –requisite (if any):	Phytochemistry (2)				
6	Co –requisite (if any):					
7	Program (s) in which the course is offered:	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	Language of teaching the course:	English				
9	Study System	semester				
10	Mode of delivery:	Regular				
11	Location of teaching the course:	University				
12	Prepared By:	Dr. Abdulrahman Roshan				

II. Course Description:

This course is designed to provide students with basic knowledge of herbal medicine and dietary supplements that are used for prevention and/or treatment of diseases affecting the respiratory, cardiovascular, nervous, GI, renal, endocrine, dermatological and musculoskeletal systems. The course focuses on their pharmacological properties, indications, proper dosing, precautions, contraindications, adverse effects, herb-herb, and herb-drug interactions. Regulation, evaluation, quality control, and standardization of herbal products are also covered.

III. Course Objectives:

Student will be able to

1-Understand the concept of complementary and alternative medicine as phytotherapy and herbal remedies, homeopathy, aromatherapy, flower remedies, chiropractic, acupuncture, cupping, crystal therapy and reflexology.

2- Demonstrate knowledge of the different pharmacological activities and uses of medicinal plants (Phytotherapy).

3- Recognizes herb contraindications and possible drug-herb interactions

4- Understanding the Quality control methods of herbal products and consider the methods recommended by WHO.

IV. Course Intended learning outcomes (CILOs) of the course		WRITE Symbol and number of PILOs
a.1	Recognize the concept and principles of phytotherapy, complementary and alternative medicine, its different types and methods of production, regulation and quality control of herbal drugs and formulations.	**A2, A3**
a.2	Identify the pharmacological properties, adverse reactions, contraindications and available dosage form of selected herbal medications that are used to relief some common health problems.	**A3**
b.1	Suggest appropriate drugs of the natural origin for the treatment of common diseases.	**B3**
b.2	Evaluate the possible drug interactions and adverse reactions of herbal drug formulations used in phytotherapy.	**B3**
c.1	Utilize naturally occurring drugs for preparation of herbal formulations that can be used safely for treatment (mainly the OTC) of different body systems diseases.	**C2**
c.2	Advise patients about uses, precautions, side effects and interactions of herbal drugs and dietary supplements during treatment of different disorders.	**C4**
d.1	Demonstrate decision making, problem solving and communication skills.	**D2**
d.2	Analyze information using scientific and library-based knowledge to prescribe herbal OTC medication based on understanding etiology of some diseases.	**D3**

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1- Recognize the concept and principles of phytotherapy, complementary and alternative medicine, its different types and methods of production, regulation and quality control of herbal drugs and formulations.	- Interactive Lectures - Case-Study - Assignments	- Written Exams (midterm and final) - Multiple Choice Questions (MCQs) - Assignments **&** Coursework Activities - Quizzes
a2- Identify the pharmacological properties, adverse reactions, contraindications and available dosage form of selected herbal medications that are used to relief some common health problems.		

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1- Suggest appropriate drugs of the natural origin for the treatment of common diseases.	- Interactive Lectures & Discussion - Case-Study - Assignments - Problem-based Learning	- Written Exams (midterm and final) - Multiple Choice Questions (MCQs) - Assignments **&** Coursework Activities - Quizzes - Problem Solving Exercise - Case Presentation
b2- Evaluate the possible drug interactions and adverse reactions of herbal drug formulations used in phytotherapy.		

(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1- Utilize naturally occurring drugs for preparation of herbal formulations that can be used safely for treatment (mainly	- Case-Study - Assignments - Problem-based Learning	- Assignments **&** Coursework Activities - Problem Solving Exercise - Case Presentation

the OTC) of different body systems diseases.		
c2- Advise patients about uses, precautions, side effects and interactions of herbal drugs and dietary supplements during treatment of different disorders.		

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1- Demonstrate decision making, problem solving and communication skills.	- Discussion - Case-Study - Assignments - Problem-based Learning	- Assignments **&** Coursework Activities - Reports of Assignments - Problem Solving Exercise - Oral & Case Presentation
d2- Analyze information using scientific and library-based knowledge to prescribe herbal OTC medication based on understanding etiology of some diseases.		

V. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	contact hours
1	Complementary and alternative medicine	a1, d1	Introduction; Complementary and alternative medicine do not use medicinal plants; Traditional Systems of Herbal Medicine; Traditional Chinese Medicine (TCM); Indian Ayurvedic Medicine	1	2
2	Complementary and alternative medicine	a1, d1	The Greek and Roman Contribution; The Middle ages and Islamic Contribution (Arabic Medicine).	1	2

			Herbal medicine today (Phytotherapy).		
3	Rational phytotherapy	a2, b1, b2, c1, c2, d1, d2	Drugs acting on: -The gastrointestinal system. -The cardiovascular system. -The respiratory system and the endocrine system. -The reproductive system and the musculoskeletal system.	4	8
4	Mid Term Exam	a1, a2, b1, b2, c1, c2, d1		1	2
5	Rational phytotherapy	a2, b1, b2, c1, c2, d1, d2	Drugs acting on: -The central nervous system and the renal system. -The eye, The ear, nose and orthopharynx. Supportive Therapies for Stress, Aging and Debility. -Herbal drugs for treatment of obesity. - Herb-drug interactions.	4	8
7	Production and regulation	a1, c1, d1, d2	Herbal products regulation. Herbal formulation and dosage forms.	1	2
8	Quality control of herbal drugs	a1, d1	Quality control of herbal drugs (-Evaluation of Medicinal Crude drugs -Pharmacoepeial Standards -Chromatography and its application)	2	4
9	General revision	a1, a2, b1, b2, c1, c2, d1, d2		1	2
10	Final Exam	a1, a2, b1, b2, c1, c2, d1		1	2
Number of Weeks /and Units Per Semester				**16**	**32**

VI. Teaching strategies of the course:

- Interactive Lectures
- Case-Study
- Assignments
- Discussion
- Problem-based Learning

VII. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Attendance / quiz/ Exercises	b1, b2, c1, c2, d1, d2	1-6, 8-12	5%
2	Research assignment	a2, b1, b2, c1, c2, d1, d2	12	5%

VIII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Attendance / quiz/ Exercises	All	5	5%	b1, b2, c1, c2, d1, d2
2	Med- Term Exam	7	20	10%	a1, a2, b1, b2, c1, c2, d1
3	Research assignment	12	5	5%	a2, b1, b2, c1, c2, d1, d2
4	Final exam	16	70	70%	a1, a2, b1, b2, c1, c2, d1
5	Total		100	100%	

IX. Learning Resources:

1- Required Textbook(s) (maximum two).

1- Evans, William Charles, Evans, Daphne, & Trease, George Edward. (2009). "Trease and Evans pharmacognosy" (16th ed. / rev. with the assistance of Daphne Evans.). Saunders/Elsevier.
2- Heinrich M., Barnes J., Garcia J., Gibbons S., Williamson E. (2018) Fundamentals of Pharmacognosy and Phytotherapy 3rd Edition, Saunders/Elsevier

2- Essential References.

1- Marilyn Barrett. (2004). The Handbook of Clinically Tested Herbal Remedies,

	(volumes 1 and 2). The Haworth Press, Inc.USA 2- Kerry Bone and Simon Mills. (2013). Principles and practice of Phytotherapy. Elsevier Ltd. 3-Manuchair Ebadi. (2007) Pharmacodynamic Basis of HERBAL MEDICINE, (second edition). CRC Press, Taylor & Francis Group.
3- Electronic Materials and Web Sites *etc.*	
	1- http://www.herbmed.org 2- https://www.nccih.nih.gov

X. Course Policies:	
1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** - Assignments and projects will be assessed individually unless the teacher request for group work
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:** -

Template for Course Plan (Syllabus) of Phytotherapy

I. – Information about Faculty Member Responsible for the Course:

		Office Hours					
Name of Faculty Member							
Location& Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Identification and General Information:

1	Course Title:	Phytotherapy				
2	Course Number & Code:	PHA476				
3	Credit hours:	C.H				Total
		Th.	Seminar	Pr.	F. Tr.	
		2				2
4	Study level/year at which this course is offered:	Fourth level, first semester				
5	Pre –requisite (if any):	Phytochemistry (2)				
6	Co –requisite (if any):	*None*				
7	Program (s) in which the course is offered	P Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	Language of teaching the course:	English				
9	System of Study:	*Semester*				
10	Mode of delivery:	Regular				
11	Location of teaching the course:	University				

III. Course Description:

This course is designed to provide students with basic knowledge of herbal medicine and dietary supplements that are used for prevention and/or treatment of diseases affecting the respiratory, cardiovascular, nervous, GI, renal, endocrine, dermatological and musculoskeletal systems. The course focuses on their pharmacological properties, indications, proper dosing, precautions, contraindications, adverse effects, herb-herb, and herb-drug interactions. Regulation, evaluation, quality control, and standardization of herbal products are also covered.

IV. Course Objectives:

Student will be able to

1-Understand the concept of complementary and alternative medicine as phytotherapy and herbal remedies, homeopathy, aromatherapy, flower remedies, chiropractic, acupuncture, cupping, crystal therapy and reflexology**.**

2- Demonstrate knowledge of the different pharmacological activities and uses of medicinal plants (Phytotherapy).

3- Recognizes herb contraindications and possible drug-herb interactions

4- Understanding the Quality control methods of herbal products and consider the methods recommended by WHO.

V. Intended learning outcomes (ILOs) of the course:

- Brief summary of the knowledge or skill the course is intended to develop:

1- Recognize the concept and principles of phytotherapy, complementary and alternative medicine, its different types and methods of production, regulation and quality control of herbal drugs and formulations.
2- Identify the pharmacological properties, adverse reactions, contraindications and available dosage form of selected herbal medications that are used to relief some common health problems.
3- Suggest appropriate drugs of the natural origin for the treatment of common diseases.
4- Evaluate the possible drug interactions and adverse reactions of herbal drug formulations used in phytotherapy.
5- Utilize naturally occurring drugs for preparation of herbal formulations that can be used safely for treatment (mainly the OTC) of different body systems diseases.
6- Advise patients about uses, precautions, side effects and interactions of herbal drugs and dietary supplements during treatment of different disorders.
7- Demonstrate decision making, problem solving and communication skills.
8- Analyze information using scientific and library-based knowledge to prescribe herbal OTC medication based on understanding etiology of some diseases.

VI. Course Content:

- Distribution of Semester Weekly Plan of Course Topics/Items and Activities.

A – Theoretical Aspect:

Order	Topics List	Week Due	Contact Hours
1	Complementary and alternative medicine: Introduction; those do not use medicinal plants; Traditional Systems of Herbal Medicine; Traditional Chinese Medicine (TCM);	1st	2

	Indian Ayurvedic Medicine		
2	The Greek and Roman Contribution; The Middle ages and Islamic Contribution (Arabic Medicine). Herbal medicine today (Phytotherapy).	2nd	2
3	Rational Phytotherapy. Drugs acting on the gastrointestinal system.	3rd	2
4	Rational Phytotherapy. Drugs acting on: The cardiovascular system.	4th	2
5	Rational Phytotherapy. Drugs acting on: The respiratory system and the endocrine system.	5th	2
6	Rational Phytotherapy. Drugs acting on: The reproductive system and the musculoskeletal system.	6th	2
7	Mid-term exam	7th	2
8	Rational Phytotherapy. Drugs acting on: The central nervous system and the renal system.	8th	2
9	Rational Phytotherapy. Drugs acting on: The eye, The ear, nose and orthopharynx. Supportive Therapies for Stress, Aging and Debility.	9th	2
10	Rational Phytotherapy. Drugs acting on: Herbal drugs for treatment of obesity. Herb-drug interactions	10th & 11th	4
11	Herbal products regulation. Herbal formulation and dosage forms.	12th	2

12	Quality control of herbal drugs -Evaluation of Medicinal Crude drugs -Pharmacoepeial Standards	13th	2
13	Quality control of herbal drugs -Chromatography and its application	14th	2
14	General revision	15th	2
15	Final Exam	16th	2
Number of Weeks /and Units Per Semester		**16**	**32**

VII. Teaching strategies of the course:

- Interactive Lectures
- Case-Study
- Assignments
- Discussion
- Problem-based Learning

VIII. Assignments:

No	Assignments	Week Due	Mark
1	Attendance / quiz/ Exercises	1-6, 8-12	5%
2	Research assignment	12	5%

IX. Schedule of Assessment Tasks for Students During the Semester:

Assessment	Type of Assessment Tasks	Week Due	Mark	Proportion of Final Assessment
1	Attendance / quiz/ Exercises	All	5	5%
2	Mid- Term Exam	7	20	10%
3	Research assignment	12	5	5%
4	Final exam	16	70	70%
5	Total		100	100%

X. Learning Resources:

1- Required Textbook(s) (maximum two).

1- Evans, William Charles, Evans, Daphne, & Trease, George Edward. (2009). "Trease and Evans pharmacognosy" (16th ed. / rev. with the assistance of Daphne Evans.). Saunders/Elsevier.
2- Heinrich M., Barnes J., Garcia J., Gibbons S., Williamson E. (2018) Fundamentals of Pharmacognosy and Phytotherapy 3rd Edition, Saunders/Elsevier

2- Essential References.

1 -Marilyn Barrett. (2004). The Handbook of Clinically Tested Herbal Remedies, (volumes 1 and 2). The Haworth Press, Inc.USA
2 -Kerry Bone and Simon Mills. (2013). Principles and practice of Phytotherapy. Elsevier Ltd.
3-Manuchair Ebadi. (2007) Pharmacodynamic Basis of HERBAL MEDICINE, (second edition). CRC Press, Taylor & Francis Group.

3- Electronic Materials and Web Sites *etc*.

-1 http://www.herbmed.org
-2 https://www.nccih.nih.gov

XI. Course Policies:

1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam.
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** - Assignments and projects will be assessed individually unless the teacher request for group work.
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course.
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:**

Course Specification of Pharmaceutical Care

I. Course Identification and General Information:

1	Course Title:	Pharmaceutical Care				
2	Course Code & Number:	PHA483				
3	Credit hours:	C.H				TOTAL
		Th.	Seminar	practical	Training.	
		1		1		2
4	Study level/ semester at which this course is offered:	Fourth level/first semester				
5	Pre –requisite (if any):	Orientation to Pharmacy				
6	Co –requisite (if any):					
7	Program (s) in which the course is offered:	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	Language of teaching the course:	English Language				
9	Study System	Semester				
10	Mode of delivery:	Regular				
11	Location of teaching the course:	University				
12	Prepared By:	Ass. Prof. Dr. Mujeeb Al-Nahari				

II. Course Description:

This course aims to provide students with the essential concept, process and plans of pharmaceutical care. It focuses on roles of pharmacists in Pharmacist's Patient Care Processes, ensuring the rational use of medicines, reporting of side effects; and counselling patients about drug effects, about self-care and about disease prevention.

III.	Course Intended learning outcomes (CILOs) of the course	WRITE Symbol and number of PILOs
a.1	Demonstrate the objectives of pharmaceutical care as well as the responsibilities of pharmacists in improving health outcomes.	A4
a.2	Outline the process for assessment and resolving of drug related problem.	A4
b.1	Effectively use patient-specific data to formulate pharmaceutical care plans to resolve the drug related problems.	B3
b.2	Apply different skills for patient interview and communication.	B3, B4

c.1	Design pharmaceutical care plans to optimize medicines use and improve health outcomes.	C2, C4, C5
c.2	Perform skills in medication documentation to maintain accurate and comprehensive patient records.	C2
d.1	Communicate effectively with other health care providers in different settings when applying pharmaceutical care in their practice.	D1
d.2	Use effectively up-to-date information in the areas of pharmaceutical care to improve pharmacy profession.	D3

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1- Demonstrate the objectives of pharmaceutical care as well as the responsibilities of pharmacists in improving health outcomes.	Lectures Seminar	Exams Quizzes
a2- Outline the process for assessment and resolving of drug related problem.	Lectures Seminar	Exams Quizzes

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1- Effectively use patient-specific data to formulate pharmaceutical care plans to resolve the drug related problems.	Lectures Case Study Brainstorming Small group discussions Practical session	Exams Quizzes Reports Cases Presentation
b2- Apply different skills for patient interview and communication.	Case Study Brainstorming Small group discussions Practical session	Exams Quizzes Reports Cases Presentation

(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1- Design pharmaceutical care plans to optimize medicines use and improve	Case Study Small group discussions	Practical Exam Reports

health outcomes.	Practical session	Homework Cases Presentation
c2- Perform skills in medication documentation to maintain accurate and comprehensive patient records.	Case Study Small group discussions Practical session	Practical Exam Reports Homework Cases Presentation

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1- Communicate effectively with other health care providers in different settings when applying pharmaceutical care in their practice.	Case Study Small group discussions Practical session	Reports Homework Cases Presentation
d2- Use effectively up-to-date information in the areas of pharmaceutical care to improve pharmacy profession.	Case Study Small group discussions Practical session	Reports Homework Cases Presentation

IV. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	contact hours
1	Introduction to Pharmaceutical Care	a1, a2, b1, b2, c1, c2, d1, d2	Introduction to Pharmaceutical Care	1	1
2	Patient Case Presentation	a1, a2, b1, b2, c1, c2, d1, d2	Patient Case Presentation	1	1
3	Drug Related Problems (DRPs)	a1, a2, b1, b2, c1, c2, d1, d2	Drug Related Problems (DRPs)	1	1
4	Pharmacist's Patient Care Process (PPCP)	a1, a2, b1, b2, c1, c2, d1, d2	Pharmacist's Patient Care Process (PPCP)	1	1
5	The Assessment	a1, a2, b1, b2, c1, c2, d1, d2	The Assessment	1	1
6	Mid Exam	a1, a2, b1, b2, c1, c2, d1, d2	Mid Exam	1	1
7	Pharmaceutical Care Plan	a1, a2, b1, b2, c1, c2, d1, d2	Pharmaceutical Care Plan	1	1
8	Patient	a1, a2, b1, b2, c1,	Patient	1	1

	Counselling	c2, d1, d2	Counselling		
9	Patient Compliance	a1, a2, b1, b2, c1, c2, d1, d2	Patient Compliance	1	1
10	Documentation in Pharmaceutical Care	a1, a2, b1, b2, c1, c2, d1, d2	Documentation in Pharmaceutical Care	1	1
11	Medication History	a1, a2, b1, b2, c1, c2, d1, d2	Medication History	1	1
12	Communication Skills	a1, a2, b1, b2, c1, c2, d1, d2	Communication Skills	2	2
13	Standards of Patient Care	a1, a2, b1, b2, c1, c2, d1, d2	Standards of Patient Care	1	1
14	Revision	a1, a2, b1, b2, c1, c2, d1, d2	Revision	1	1
15	Final Exam	a1, a2, b1, b2, c1, c2, d1, d2	Final Exam	1	1
Number of Weeks /and Units Per Semester				**16**	**16**

B - Practical Aspect: (if any)

Order	Tasks/ Experiments	Number of Weeks	contact hours	Learning Outcomes
1	Orientation	1	1	a1, a2, b1, b2, c1, c2, d1, d2
2	Understanding patient medical chart	1	1	a1, a2, b1, b2, c1, c2, d1, d2
3	Cases on Patient Case Presentation	1	1	a1, a2, b1, b2, c1, c2, d1, d2
4	Writing SOAP	1	1	a1, a2, b1, b2, c1, c2, d1, d2
5	Cases on Pharmacist's Patient Care Processes	2	2	a1, a2, b1, b2, c1, c2, d1, d2
6	Mid - Exam	1	1	a1, a2, b1, b2, c1, c2, d1, d2
7	Cases on Drug related problems	2	2	a1, a2, b1, b2, c1, c2, d1, d2
8	Cases on patient counselling	1	1	a1, a2, b1, b2, c1, c2, d1, d2
9	Cases on Patient Compliance	1	1	a1, a2, b1, b2, c1, c2, d1, d2
10	Taking Medication history	1	1	a1, a2, b1, b2, c1, c2, d1, d2

11	Revision	1	1	a1, a2, b1, b2, c1, c2, d1, d2
12	**Final Exam**	1	1	a1, a2, b1, b2, c1, c2, d1, d2
Number of Weeks /and Units Per Semester		**14**	**14**	

V. Teaching strategies of the course:

Lectures
Seminars
Case Study
Brainstorming
Discussions
Small group discussions
Practical session

VI. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Quizzes	a1, a2, b1, b2, c1, c2, d1, d2	9th	5
2	Reports	a1, a2, b1, b2, c1, c2, d1, d2	1th-10th	10
3	Homework	a1, a2, b1, b2, c1, c2, d1, d2	6th	5

VII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Attendance (Theoretical)	All weeks	5	5%	a1, a2, b1, b2, c1, c2, d1, d2
2	Attendance (Practical)	All	5	5%	a1, a2, b1, b2,

		weeks			c1, c2, d1, d2
3	Quiz (Theoretical)	6th	5	5%	a1, a2, b1, b2, c1, c2, d1, d2
4	Mid Exam (Practical)	6th	5	5%	a1, a2, b1, b2, c1, c2, d1, d2
5	Mid Exam (Theoretical)	7th	10	10%	a1, a2, b1, b2, c1, c2, d1, d2
6	Homework (Practical)	9th	5	5%	a1, a2, b1, b2, c1, c2, d1, d2
7	Practical Reports	1th-10th	10	10%	a1, a2, b1, b2, c1, c2, d1, d2
8	Final Exam (Practical)	14th	15	15%	a1, a2, b1, b2, c1, c2, d1, d2
9	TOTAL		100	100	

VIII. Learning Resources:

1- Required Textbook(s) (maximum two).

- Strand, L. M., Cipolle, R. J., & Morley, P. C. (2012). *Pharmaceutical care practice*. New York: McG Hill.

2- Essential References.

1- da Costa, F. A., Van Mil, J. F., & Alvarez-Risco, A. (Eds.). (2019). *The pharmacist guide to implementing pharmaceutical care* (pp. 4-6). Springer International Publishing.
2- DiPiro, J. T., DiPiro, C. V., Schwinghammer, T. L., & Wells, B. G. (2023). *Pharmacotherapy handbook*. McGraw-hill.

3- Electronic Materials and Web Sites *etc.*

1- https://accesspharmacy.com/

IX. Course Policies:

1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam.
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed

	to attend the exam and will be considered absent.
4	**Assignments & Projects:** - Assignments and projects will be assessed individually unless the teacher request for group work.
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course.
6	**Plagiarism:** Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:**

Template for Course Plan (Syllabus)

I. - Information about Faculty Member Responsible for the Course:

		Office Hours					
Name of Faculty Member							
Location& Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Identification and General Information:

1-	Course Title:	Pharmaceutical Care				
2-	Course Number & Code:	PHA483				
3-	Credit hours:	C.H				Total
		Th.	Seminar	Pr.	F. Tr.	
		1		1		2
4-	Study level/year at which this course is offered:	Fourth level/first semester				
5-	Pre –requisite (if any):	Orientation to Pharmacy				
6-	Co –requisite (if any):					
7-	Program (s) in which the course is offered	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8-	Language of teaching the course:	English Language				
9-	System of Study:	Semester				
10-	Mode of delivery:	Regular				
11-	Location of teaching the course:	University				

III. Course Description:

This course aims to provide students with the essential concept, process and plans of pharmaceutical care. It focuses on roles of pharmacists in Pharmacist's Patient Care Processes, ensuring the rational use of medicines, reporting of side effects; and counselling patients about drug effects, about self-care and about disease prevention.

IV. Intended learning outcomes (ILOs) of the course:

- Brief summary of the knowledge or skill the course is intended to develop:

1- Demonstrate the objectives of pharmaceutical care as well as the responsibilities of pharmacists in improving health outcomes.
2- Outline the process for assessment and resolving of drug related problem.
3- Effectively use patient-specific data to formulate pharmaceutical care plans to resolve the drug related problems.
4- Apply different skills for patient interview and communication.
5- Design pharmaceutical care plans to optimize medicines use and improve health outcomes.
6- Perform skills in medication documentation to maintain accurate and comprehensive patient records.
7- Communicate effectively with other health care providers in different settings when applying pharmaceutical care in their practice.
8- Use effectively up-to-date information in the areas of pharmaceutical care to improve pharmacy profession.

V. Course Content:

- Distribution of Semester Weekly Plan of Course Topics/Items and Activities.

A – Theoretical Aspect:

Order	Topics List	Week Due	Contact Hours
1	Introduction to Pharmaceutical Care	1st	1
2	Patient Case Presentation	2nd	1
3	Drug Related Problems (DRPs)	3rd	1
4	Pharmacist's Patient Care Process (PPCP)	4th	1
5	The Assessment	5th	1
6	Mid Exam	6th	1
7	Pharmaceutical Care Plan	7th	1
8	Patient Counselling	8th	1
9	Patient Compliance	9th	1
10	Documentation in Pharmaceutical Care	10th	1

11	Medication History	11th	1
12	Communication Skills	12th & 13th	2
13	Standards of Patient Care	14th	1
14	Revision	15th	1
15	Final Exam	16th	1
Number of Weeks /and Units Per Semester		**16**	**16**

B – Practical Aspect: ***(if any)***

Order	Topics List	Week Due	Contact Hours
1	Orientation	1st	1
2	Understanding patient medical chart	2nd	1
3	Cases on Patient Case Presentation	3rd	1
4	Writing SOAP	4th	1
5	Cases on Pharmacist's Patient Care Processes	5th & 6th	2
6	Mid - Exam	7th	1
7	Cases on Drug related problems	8th & 9th	2
8	Cases on patient counselling	10th	1
9	Cases on Patient Compliance	11th	1
10	Taking Medication history	12th	1
11	Revision	13th	1
12	**Final Exam**	14th	1
Number of Weeks /and Units Per Semester		**14**	**14**

VI. Teaching strategies of the course:
Lectures
Seminars
Case Study
Brainstorming
Discussions
Small group discussions
Practical session

VII. Assignments:

No	Assignments	Week Due	Mark
1	Quizzes	9th	5
2	Reports	1th-10th	10
3	Homework	6th	5

VIII. Schedule of Assessment Tasks for Students During the Semester:

Assessment	Type of Assessment Tasks	Week Due	Mark	Proportion of Final Assessment
1	Attendance (Theoretical)	All weeks	5	5%
2	Attendance (Practical)	All weeks	5	5%
3	Quiz (Theoretical)	6th	5	5%
4	Mid Exam (Practical)	6th	5	5%
5	Mid Exam (Theoretical)	7th	10	10%
6	Homework (Practical)	9th	5	5%
7	Practical Reports	1th-10th	10	10%
8	Final Exam (Practical)	14th	15	15%
9	TOTAL		100	100

IX. Learning Resources:

1- Required Textbook(s) (maximum two).

1- Strand, L. M., Cipolle, R. J., & Morley, P. C. (2012). *Pharmaceutical care practice*. New York: McGraw-Hill.

2- Essential References.

1- da Costa, F. A., Van Mil, J. F., & Alvarez-Risco, A. (Eds.). (2019). *The pharmacist guide to implementing pharmaceutical care* (pp. 4-6). Springer International Publishing.
2- DiPiro, J. T., DiPiro, C. V., Schwinghammer, T. L., & Wells, B. G. (2023). *Pharmacotherapy handbook*. McGraw-hill.

3- Electronic Materials and Web Sites *etc*.

1- https://accesspharmacy.com/

X. Course Policies:	
Unless otherwise stated, the normal course administration policies and rules of the Faculty of ----- apply. For the policy, see: ----------	
1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam.
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** - Assignments and projects will be assessed individually unless the teacher request for group work.
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course.
6	**Plagiarism:** Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:**

Fourth Level, Second Semester

Course Specification of Drug Delivery Systems

I.	Course Identification and General Information:					
1	**Course Title:**	**Cosmetics**				
2	**Course Code & Number:**					
3	**Credit hours:**	C.H				Total
		Th.	Seminar	Pr.	Tr.	
		2	-	-	-	2
4	**Study level/ semester at which this course is offered:**	4th level – 2nd semester				
5	**Pre –requisite (if any):**	Pharmaceutics III				
6	**Co –requisite (if any):**	NA				
8	**Program (s) in which the course is offered:**	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
9	**Language of teaching the course:**	English				
10	**Location of teaching the course:**	Al-Saeed University Campus				
11	**Prepared By:**	Bassam Al-Shaibani				

II. Course Description:

This course is aimed to provide students with essential knowledge about the development of dosage forms, targeted drug delivery, various drug delivery systems, drug release patterns from immediate and modified drug delivery systems and novel dosage forms used to control drug delivery and release to improve the delivery of the drug to the body and to minimize side effects. As well as looking at modern methods in the development of pharmaceutical forms supported by examples from the market.

III. Intended learning outcomes (ILOs)

	Program Intended learning outcomes (PILOs). After the completion of the program successfully, student will be able to:		Course Intended learning outcomes (CILOs). After the completion of the course successfully, student will be able to:
A2.	Demonstrate the essential knowledge of techniques and the key stages in drug and biopharmaceuticals discovery, development, manufacturing; and controlling and ensuring their quality.	a1.	Describe the different barriers of delivery systems, mechanisms of drug release, various novel techniques for each system, factors affecting drug release and drug delivery systems performance.
A3.	Explain competently the pharmacological effects, therapeutic efficacy and safety of pharmaceutical and related products.	a2.	Discuss the different aspects, methods of preparation and applications of different novel drug delivery systems.
B1.	Predict the drug properties from molecular structure that affect the pharmacokinetic parameters and interaction with targets in the body.	b1.	Hypothesize suitable delivery systems for a specific drug and therapeutic situation depending on physicochemical properties of drug.
B2.	Relate the scientific disciplines used in each stage of drug discovery, development, manufacturing, quality control and quality assurance of natural and synthetic medicines and biopharmaceuticals.	b2.	Compare between different types of drug delivery systems based on methods of formulation and evaluation to determine the optimum candidates for each system.
B3.	Practice thinking skills in designing pharmaceutical plans to optimize medication use and reduce the possibility of medication errors, and in solving problems related to pharmaceutical preparations and other related sciences.	b3.	Investigate the optimum candidate of drugs for each novel delivery systems to develop most effective therapy.
C4.	Provide counselling and advise to patients, their families, community and other health care professionals about safe and rational use of medicines and medical devices, self-care and health promotion and disease prevention.	c1.	Choose the drug delivery route and suitable delivery system according to physiochemical properties of drugs and patient compliance.
D1.	Demonstrate good ability at effective management and leadership, critical thinking, problem solving, communication skills, use of modern technology, and collaboration with others.	d.1	Evaluate effectively the literature from different information resources and manage time effectively to design acceptable drug delivery systems.

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	**Teaching strategies**	**Assessment Strategies**
a1. Describe the different barriers of delivery systems, mechanisms of drug release, various novel techniques for each system, factors affecting drug release and drug delivery systems performance.	Interactive lecture, Demonstration, Simulation,	Examination, Student Presentation,
a2. Discuss the different aspects, methods of preparation and applications of different novel drug delivery systems.	Practical work, Demonstration, Cooperative Learning, Simulation,	Student Presentation, Reports,

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	**Teaching strategies**	**Assessment Strategies**
b1. Hypothesize suitable delivery systems for a specific drug and therapeutic situation depending on physicochemical properties of drug.	Discussion, Cooperative Learning, Study Tours,	Practical Work, Portfolios,
b2. Compare between different types of drug delivery systems based on methods of formulation and evaluation to determine the optimum candidates for each system.	Interactive lecture, Discussion, Problem Solving, Micro-teaching, Simulation,	Examination, Project Work,
b3. Investigate the optimum candidate of drugs for each novel delivery systems to develop most effective therapy.	Interactive lecture, Discussion, Presentation, Simulation,	Examination, Student Presentation, Portfolios

(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	**Teaching strategies**	**Assessment Strategies**
c1. Choose the drug delivery route and suitable delivery system according to physiochemical properties of drugs and patient compliance.	Discussion, Demonstration, Brain Storming,	Home Work, Student Presentation,

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	**Teaching strategies**	**Assessment Strategies**
d1. Evaluate effectively the literature from different information resources and manage time effectively to design acceptable drug delivery systems.	Cooperative Learning, Study Tours, Practicum,	Examination, Reports,

IV. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	Contact Hours
1	Fundamentals of novel drug delivery systems	a1, a2, b1, c1, d1	Introduction to novel drug delivery systems, rationale for novel drug delivery, barriers to drug delivery, factors affecting design of a delivery systems, advantages and disadvantages.	2	4
2	Oral modified drug delivery systems	a2, b1, b3, d1	Definition, mechanisms of different oral release of delivery systems (coat, matrix and osmotic), examples for each release systems, osmotic pump.	3	6
3	Transdermal drug delivery systems	a1, a2, b2, d1,	Definition, percutaneous absorption, types of transdermal patches, components of transdermal patches and skin penetration enhancing methods, advantages and disadvantages.	2	4
4	Medium exam	a1, b2, b3, d1,		1	2
5	Polymeric drug delivery systems	a1, b1, b3, c1, d1,	Definition, classification of polymers, ideal properties of polymers, selection criteria and applications on pharmacy.	1	2
6	Protein drug delivery systems	a1, b1, b3, c1, d1,	Structure and types of proteins, functions of proteins and peptides, challenges and rationale of protein delivery, barriers, denaturation, marketed drug systems.	1	2
7	Liposomes	a2, b2, c1, d1,	Definition, structure, advantages and disadvantages, classification, applications,	1	2

			marketed liposomes.		
8	Gastro-retentive systems	a1, b2, b3, c1, d1,	Definition, candidates, needs, advantages and disadvantages, factors affecting on gastric retention and different approaches.	2	4
9	Microspheres	a2, b2, c1, d1,	Definition, mechanisms, classifications, applications with marketing microspheres.	1	2
10	Nanoparticles	a2, b2, c1, d1,	Definition, mechanisms, classifications, applications with marketing available nanoparticles.	1	2
11	Final exam	a1, b1, b3, c1,		1	2
Number of Weeks /and Units Per Semester				**16**	**32**

B - Practical Aspect: (if any)
NA

V. Teaching strategies of the course:

Interactive lectures
Presentation
Simulation
Interactive class discussion

VI. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark	Proportion of Final Assessment
1	Midterm	a1, b2, b3, d1,	7th	20	20%
2	Assignment (presentation a paper)	a1, a2, b1, c1, d1,	12th	10	10%
3	Attendance	a1, a2, b1, c1, d1,	15th	10	10%

4	Final exam	a1, b1, b3, c1,	16th	60	60%
Total			16	100	100%

VII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Presentation a paper	12th	10	10%	a1, a2, b1, c1, d1,

III. Learning Resources:

1- Required Textbook(s) (maximum two).

3. N. Jain, (2008), Controlled and Novel Drug Delivery, 1st edition, CBS Publishers and Distributors, USA.

2- Essential References.

7. Loyd V. Allen, (2011), Ansel's Pharmaceutical Dosage Forms and Drug Delivery ystems, 9th edition, Lippincott Williams and Wilkins, USA.
8. Yie Chien, (1991), Novel Drug Delivery Systems, 2nd edition, CRC Press, USA.
9. Binghe W., Teruna J., (2005), Drug Delivery: Principles and Apllications, 1st edition, Wiley-Interscience, USA.
10. Joseph R. Vincent L., (1987), Controlled Drug Delivery: Fundamentals and Applications, 1st editio CRC Press, USA.

3- Electronic Materials and Web Sites *etc*.

- Controlled Release Society (http://www.controlledreleasesociety.org/pages/default.aspx).
- Journal of Controlled Release (http://www.journals.elsevier.com/journal-of-controlled-release).

IX. Course Policies:

Based on university regulations, the following aspects should be figured out:

1	**Class Attendance:** - Attendance is mandatory for all students for credit to be received and will be

	monitored. - The student is excluded from class if absence percentage exceeds 15% with no excuse or 25% with an accepted excuse.
2	**Tardy:** - Attendance will be taken every lecture at the first 20 minutes. - Students are considered absent if they are 20 minutes or more late to a single class period. - Students arriving to class after the first 20 minutes will be counted tardy. - The percentage of students' unexcused retard should not exceed three lectures. Otherwise, they will be counted absent.
3	**Exam Attendance/Punctuality:** - All students registered for the course are required to attend the assigned exams. - Dates and locations will be posted prior to the examination date. No re-sit exams are carried out for in-course examinations. - If the student misses an in-course examination and his/her excuse was accepted, the missed exam grade will be calculated from the final exam grade. - If a student misses the final exam, and unless he/she provides an accepted excuse, a grade of F will be granted. - If the excuse was accepted, a student may take the exam as first attempt in the second attempt examinations.
4	**Assignments & Projects:** - All assignments must be submitted on or before their due time. Late submission will not be accepted. Otherwise, 2% of the obtained marks will be subtracted for each late day, including weekends and holidays. Projects must be submitted on or before the dead-lines.
5	**Cheating**: - Cheating in examinations or tests may take the form of copying from another student or bringing unauthorized materials into the exam room (e.g., crib notes, pages or cell phones). - Exam cheating can also include exam impersonation. - A student found guilty of contributing to cheating in examinations or term assignments is also subject to serious academic penalty. Please refer to the academic regulations of Al Rowad university for further details.
6	**Plagiarism**: - "To plagiarize is to take ideas or words of another person and pass them off as one's own". - Plagiarism or any other form of cheating in examinations, term tests or academic work is subject to serious academic penalty (e.g. suspension or expulsion from the faculty or university)
7	**Other policies:** - Cell phones / IPod /PC, and other communication or entertainment devices must be turned off during theory classes and laboratory classes. - Students should familiarize themselves with all university, college, and department policies, rules, and code of conduct.

Course Plan (Syllabus) of Drug delivery systems

I. - Information about Faculty Member Responsible for the Course:							
Name of Faculty Member	Dr. Bassam Alshaibani	Office Hours (…… hours weekly)					
Location& Telephone No.	777443417	SAT	SUN	MON	TUE	WED	THU
E-mail	bassam00001@yahoo.com						

II. Course Identification and General Information:						
1	Course Title:	Drug delivery systems				
2	Course Code & Number:					
3	Credit hours:	C.H				TOTAL
		Th.	Seminar	Pr.	Tr.	
		2	-	-	-	2
4	Study level/ semester at which this course is offered:	4th Level –2st Semester				
5	Pre –requisite (if any):	Pharmaceutics III				
6	Co –requisite (if any):	NA				
7	Program (s) in which the course is offered:	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	Language of teaching the course:	English				
9	Study System	Semester-based				
10	Mode of delivery:	Regular				
11	Location of teaching the course:	Al-Saeed university campus				
12	Prepared By:	Dr. Bassam Alshaibani				

III. Course Description:

This course is aimed to provide students with essential knowledge about the development of dosage forms, targeted drug delivery, various drug delivery systems, drug release patterns from immediate and modified drug delivery systems and novel dosage forms used to control drug delivery and release to improve the delivery of the drug to the body and to minimize side effects. As well as looking at modern methods in the development of pharmaceutical forms supported by examples from the market.

IV. Intended learning outcomes (ILOs)

	Program Intended learning outcomes (PILOs). After the completion of the program successfully, student will be able to:		Course Intended learning outcomes (CILOs). After the completion of the course successfully, student will be able to:
A2.	Demonstrate the essential knowledge of techniques and the key stages in drug and biopharmaceuticals discovery, development, manufacturing; and controlling and ensuring their quality.	a1.	Describe the different barriers of delivery systems, mechanisms of drug release, various novel techniques for each system, factors affecting drug release and drug delivery systems performance.
A3.	Explain competently the pharmacological effects, therapeutic efficacy and safety of pharmaceutical and related products.	a2.	Discuss the different aspects, methods of preparation and applications of different novel drug delivery systems.
B1.	Predict the drug properties from molecular structure that affect the pharmacokinetic parameters and interaction with targets in the body.	b1.	Hypothesize suitable delivery systems for a specific drug and therapeutic situation depending on physicochemical properties of drug.
B2.	Relate the scientific disciplines used in each stage of drug discovery, development, manufacturing, quality control and quality assurance of natural and synthetic medicines and biopharmaceuticals.	b2.	Compare between different types of drug delivery systems based on methods of formulation and evaluation to determine the optimum candidates for each system.
B3.	Practice thinking skills in designing pharmaceutical plans to optimize medication use and reduce the possibility of medication errors, and in solving problems related to pharmaceutical preparations and other related sciences.	b3.	Investigate the optimum candidate of drugs for each novel delivery systems to develop most effective therapy.
C4.	Provide counselling and advise to patients, their families, community and other health care professionals about safe and rational use of medicines and medical devices, self-care and health promotion and disease prevention.	c1.	Choose the drug delivery route and suitable delivery system according to physiochemical properties of drugs and patient compliance.
D1.	Demonstrate good ability at effective management and leadership, critical thinking, problem solving, communication skills, use of modern technology, and collaboration with others.	d.1	Evaluate effectively the literature from different information resources and manage time effectively to design acceptable drug delivery systems.

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	**Teaching strategies**	**Assessment Strategies**
a1. Describe the different barriers of delivery systems, mechanisms of drug release, various novel techniques for each system, factors affecting drug release and drug delivery systems performance.	Interactive lecture, Demonstration, Simulation,	Examination, Student Presentation,
a2. Discuss the different aspects, methods of preparation and applications of different novel drug delivery systems.	Practical work, Demonstration, Cooperative Learning, Simulation,	Student Presentation, Reports,

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	**Teaching strategies**	**Assessment Strategies**
b1. Hypothesize suitable delivery systems for a specific drug and therapeutic situation depending on physicochemical properties of drug.	Discussion, Cooperative Learning, Study Tours,	Practical Work, Portfolios,
b2. Compare between different types of drug delivery systems based on methods of formulation and evaluation to determine the optimum candidates for each system.	Interactive lecture, Discussion, Problem Solving, Micro-teaching, Simulation,	Examination, Project Work,
b3. Investigate the optimum candidate of drugs for each novel delivery systems to develop most effective therapy.	Interactive lecture, Discussion, Presentation, Simulation,	Examination, Student Presentation, Portfolios

(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	**Teaching strategies**	**Assessment Strategies**
c1. Choose the drug delivery route and suitable delivery system according to physiochemical properties of drugs and patient compliance.	Discussion, Demonstration, Brain Storming,	Home Work, Student Presentation,

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	**Teaching strategies**	**Assessment Strategies**
d1. Evaluate effectively the literature from different information resources and manage time effectively to design acceptable drug delivery systems.	Cooperative Learning, Study Tours, Practicum,	Examination, Reports,

V. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	Contact Hours
1	Fundamentals of novel drug delivery systems	a1, a2, b1, c1, d1	Introduction to novel drug delivery systems, rationale for novel drug delivery, barriers to drug delivery, factors affecting design of a delivery systems, advantages and disadvantages.	2	4
2	Oral modified drug delivery systems	a2, b1, b3, d1	Definition, mechanisms of different oral release of delivery systems (coat, matrix and osmotic), examples for each release systems, osmotic pump.	3	6
3	Transdermal drug delivery systems	a1, a2, b2, d1,	Definition, percutaneous absorption, types of transdermal patches, components of transdermal patches and skin penetration enhancing methods, advantages and disadvantages.	2	4
4	Medium exam	a1, b2, b3, d1,		1	2
5	Polymeric drug delivery systems	a1, b1, b3, c1, d1,	Definition, classification of polymers, ideal properties of polymers, selection criteria and applications on pharmacy.	1	2
6	Protein drug delivery systems	a1, b1, b3, c1, d1,	Structure and types of proteins, functions of proteins and peptides, challenges and rationale of protein delivery, barriers, denaturation, marketed drug systems.	1	2

7	Liposomes	a2, b2, c1, d1,	Definition, structure, advantages and disadvantages, classification, applications, marketed liposomes.	1	2
8	Gastro-retentive systems	a1, b2, b3, c1, d1,	Definition, candidates, needs, advantages and disadvantages, factors affecting on gastric retention and different approaches.	2	4
9	Microspheres	a2, b2, c1, d1,	Definition, mechanisms, classifications, applications with marketing microspheres.	1	2
10	Nanoparticles	a2, b2, c1, d1,	Definition, mechanisms, classifications, applications with marketing available nanoparticles.	1	2
11	Final exam	a1, b1, b3, c1,		1	2
Number of Weeks /and Units Per Semester				**16**	**32**

VI. Teaching strategies of the course:
Interactive lectures
Presentation
Simulation
Interactive class discussion

VII. Assignments:

No	**Assignments**	**Aligned CILOs(symbols)**	**Week Due**	**Mark**	**Proportion of Final Assessment**
1	Midterm	a1, b2, b3, d1,	7th	20	20%
2	Assignment (presentation a paper)	a1, a2, b1, c1, d1,	12th	10	10%
3	Attendance	a1, a2, b1, c1, d1,	15th	10	10%

4	Final exam	a1, b1, b3, c1,	16th	60	60%
Total			16	100	100%

VIII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Presentation a paper	12th	10	10%	a1, a2, b1, c1, d1,

IX. Learning Resources:

1- Required Textbook(s) (maximum two).

4. N. Jain, (2008), Controlled and Novel Drug Delivery, 1st edition, CBS Publishers and Distributors, USA.

2- Essential References.

11. Loyd V. Allen, (2011), Ansel's Pharmaceutical Dosage Forms and Drug Delivery Systems, 9th edi Lippincott Williams and Wilkins, USA.
12. Yie Chien, (1991), Novel Drug Delivery Systems, 2nd edition, CRC Press, USA.
13. Binghe W., Teruna J., (2005), Drug Delivery: Principles and Apllications, 1st edition, Wiley-Intersci USA.
14. Joseph R. Vincent L., (1987), Controlled Drug Delivery: Fundamentals and Applications, 1st edition CRC Press, USA.

3- Electronic Materials and Web Sites *etc*.

- Controlled Release Society (http://www.controlledreleasesociety.org/pages/default.aspx).
- Journal of Controlled Release (http://www.journals.elsevier.com/journal-of-controlled-release).

X. Course Policies:

Based on university regulations, the following aspects should be figured out:

1	**Class Attendance:** - Attendance is mandatory for all students for credit to be received and will be

	monitored. - The student is excluded from class if absence percentage exceeds 15% with no excuse or 25% with an accepted excuse.
2	**Tardy:** - Attendance will be taken every lecture at the first 20 minutes. - Students are considered absent if they are 20 minutes or more late to a single class period. - Students arriving to class after the first 20 minutes will be counted tardy. - The percentage of students' unexcused retard should not exceed three lectures. Otherwise, they will be counted absent.
3	**Exam Attendance/Punctuality:** - All students registered for the course are required to attend the assigned exams. - Dates and locations will be posted prior to the examination date. No re-sit exams are carried out for in-course examinations. - If the student misses an in-course examination and his/her excuse was accepted, the missed exam grade will be calculated from the final exam grade. - If a student misses the final exam, and unless he/she provides an accepted excuse, a grade of F will be granted. - If the excuse was accepted, a student may take the exam as first attempt in the second attempt examinations.
4	**Assignments & Projects:** - All assignments must be submitted on or before their due time. Late submission will not be accepted. Otherwise, 2% of the obtained marks will be subtracted for each late day, including weekends and holidays. Projects must be submitted on or before the dead-lines.
5	**Cheating**: - Cheating in examinations or tests may take the form of copying from another student or bringing unauthorized materials into the exam room (e.g., crib notes, pages or cell phones). - Exam cheating can also include exam impersonation. - A student found guilty of contributing to cheating in examinations or term assignments is also subject to serious academic penalty. Please refer to the academic regulations of Al Rowad university for further details.
6	**Plagiarism**: - "To plagiarize is to take ideas or words of another person and pass them off as one's own". - Plagiarism or any other form of cheating in examinations, term tests or academic work is subject to serious academic penalty (e.g. suspension or expulsion from the faculty or university)
7	**Other policies:** - Cell phones / IPod /PC, and other communication or entertainment devices must be turned off during theory classes and laboratory classes. - Students should familiarize themselves with all university, college, and department policies, rules, and code of conduct.

Course Specification of Industrial Pharmacy

I. Course Identification and General Information:

1	**Course Title:**	**Industrial Pharmacy**				
2	**Course Code & Number:**	**PHA459**				
3	**Credit hours:**	C.H				Total
		Th.	Seminar	practical	Training.	
		2		**1**		**3**
4	**Study level/ semester at which this course is offered:**	4th year / 2nd semester				
5	**Pre –requisite (if any):**	Pharmaceutics (3)				
6	**Co –requisite (if any):**	**none**				
7	**Program (s) in which the course is offered:**	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	**Language of teaching the course:**	**English / Arabic**				
9	**Study System**	**Semester**				
10	**Mode of delivery:**	**Regular**				
11	**Location of teaching the course:**	**Al-Saeed University campus**				
12	**Prepared By:**	**Dr. Abdulkarim Kassem Alzomor**				

II. Course Description:

This course aims to provide the students basic concepts involved in the manufacture of various drug dosage forms on large scale efficiently and economically. Moreover, they will be provided with the essential unit operation involved in the production of pharmaceuticals such as heat transfer, evaporation, drying, size reduction and separation, extraction, filtration, centrifugation, size enlargement and mixing process. The course also includes practical part that will help students to apply their learned knowledge.

III. Course Objectives:
The aim of the course is to 1. Provide the students with the necessary knowledge in the area of pharmaceutical technology. 2. Help the student to acquire the fundamentals and importance of some unit operations process in the drug development and manufacturing.

IV.	Course Intended learning outcomes (CILOs) of the course	WRITE Symbol and number of PILOs
a.1	Explain the principles of the operation methods of various equipment which used for manufacturing pharmaceutical product.	**A2**
a.2	Describe the different process for developing and manufacturing raw materials.	**A2**
b.1	Select suitable equipment required for operation process during pharmaceutical manufacturing.	**B2**
b.2	Apply an appropriate engineering process before manufacturing different dosage forms.	**B2, B4**
c.1	List the different equipment utilized to carry out different unit operations.	**C1, C5**
c.2	Employ developing equipment required for mixing, extraction, drying and other operation process.	**C1, C5**
d.1	Communicate effectively and behave in discipline with colleagues.	**D1**
d.2	Cooperate and work in a team.	**D1**

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1. Explain the principles of the operation methods of various equipment which used for manufacturing pharmaceutical product.	- Lectures and Groups discussion. - Practical	Quizzes, Written exam.
a2. Describe the different process for developing and manufacturing raw		

materials.	presentations - Self - learning.	

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1. Select suitable equipment required for operation process during pharmaceutical manufacturing. b2.Apply an appropriate engineering processes before manufacturing different dosage forms.	- Discussions and Training - Field visits - Problem solving - Practical classes	- Quizzes, Homework - Observation - Task's Evaluates

(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1.List the different equipment utilized to carry out different unit operations. c2.Employ developing equipment required for mixing, extraction, drying and other operation process .	- Discussions and Training - Field visits - Problem solving - Practical classes	- Quizzes, Homework - Observation - Task's Evaluates

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1. Cooperate and work in a team. d2. Communicate effectively and behave in discipline with colleagues.	- Group discussions - Cooperative learning. - Self – learning - Inductive and deductive	- Homework - Evaluates of Oral Presentation

V. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	contact hours
1	Heat transfer and Flow of heat	a1, a2, b2, c2, d2	- Classification of heat flow process. - Overall coefficient of heat transfer. - Mechanisms of heat transfer, conduction, convection and radiation. - Steam and steam driers - Design of heating equipment (Heat exchanger): - Tubular heaters - Finely tube heat exchanger. - Plate heat exchanger - Spiral heat exchanger - Fouling: define, causes. overcome	2	4
2	Drying	a1, a2, b1, b2, c2, d2	• Introduction, - Terminologies, - Theory of drying loss on drying and moisture content, equilibrium moisture content. - Mechanism of drying and Factors effecting drying - Classification of dryers • Dryers for solid materials. 1- Convectional dryers (Tray dryer and Fluid bed dryer) 2- Conduction dryers (Vacuum oven dryer and Vacuum Tumbler oven dryer). 3- Radiation dryers (IR dryer and Microwave radiation dryer) • Dryers for dilute solutions and suspensions. Examples: - Drum dryer	2	4

			- Spray dryer • Principles of freeze drying, freeze dryers.		
3	Evaporation	a1, a2, b1, b2, c2, d2	❖ General principals of evaporation. ❖ Factor affecting evaporation ❖ Classification of Evaporators: - jacketed kettles - tube evaporators, ❖ Forced circulation evaporator. ❖ Multiple effect evaporation. ❖ Evaporator accessories- Trap and cyclone. ❖ Evaporation problems	1	2
4	Mixing process	a1, a2, b1, b2, c2, d2, d1	Introduction to mixing - Factors effecting mixing, - Fundamentals and mechanism. Classification of mixture ❖ Solid mixers 1- Tumbler mixer examples (Drum, cube, double cone, Slant and V-shaped mixer) 2- Agitator mixer examples (Horizontal Ribbon and Vertical Ribbon) 3- Special mixer (Disona, pneumatic and zenkheta mixer) ❖ Semisolid mixer • Beater mixers • Kneaders • Triple roll • Extruders ❖ Liquid mixers, ❖ Type of liquid ❖ Factor effect on liquid mixing ❖ Vortex ❖ Type of impellers 1- Paddles 2- Turbines 3- Propellers 4- Special mixer for liqued	2	4
5	Mid-term Exam			1	2

6	Size enlargement	a1, a2, b1, b2, c2, d2, d1	❖ Methods and mechanisms of granule formation. ❖ Reasons for size enlargement. ❖ Pharmaceutical granulation equipment: ❖ High speed mixer granulator, Oscillating granulator. ❖ Extruder.	1	2
7	Size reduction	a1, a2, b1, b2, c2, d1, d2	❖ Definitions, Important of milling, ❖ Factors effecting size reduction ❖ Advantage and disadvantage of milling. ❖ Theory and mechanisms of size reduction. ❖ Classification of size reduction equipment: ❖ Intermediate size reduction: • Hammer mill • Cuter mill • Edge end mill ❖ Fine size reduction: • Fluid energy mill • Ball mill • Oscillator mill ❖ Colloidal mill	2	4
8	Filtration	a1, a2, b1, b2, c1 c2, d2	❖ Definitions, Important of filtration ❖ Factors effecting filtration ❖ Advantage and disadvantage of filtration ❖ Methods of filtration: ❖ Gravity filter ❖ Pressure filter ❖ Drum filter ❖ Paper Filter ❖ Select suitable filter ❖ Filter Aids: Define, Important	1	2

			❖ Types of filter aid: ❖ Cotton ❖ Nylon ❖ Synthetic filter aid		
9	Distillation	a1, a2, b1, b2, c1 c2, d2	❖ Definition, Important of distillation in pharmacy ❖ Type of distillation: (a) Destructive distillation, (b) Vacuum distillation, (c) Steam distillation d) Fractional distillation.	1	2
10	Extraction process	a1, a2, b1, b2, c2, d2	❖ Extraction: definition, uses, factor affecting extraction ❖ Type of extraction: - Liquid/ solid extraction • Percolation • Maceration - Liquid/ liquid extraction • Plate baffle column • Backed column • Spray column • Schiable column	1	2
11	Crystallization	a1, a2, b1, b2, c2, d2	- Definition, uses, factor affecting crystallization. - Classification, batch crystallizers, simple vacuum crystallizers. - Nucleation and crystal growth - critical humidity prevention of caking, material and energy balances	1	2
12	FINAL - EXAM			1	2
Number of Weeks /and Units Per Semester				**16**	**32**

B. Practical Aspect

Order	Practical / Exercises/ Tutorials topics	Number of Weeks	Contact Hours	Course ILOs
1	Extract Active constitutes from some natural material	**2**	4	a1,a2,b1, c1,

	using suitable solvent and economic methods for extraction.			c2, d1, d2.
2	Evaporation the solvent of extract to produced concentrate product by using Rotary Evaporation and other evaporation process.	**2**	4	a1,a2,b2, c1, c2, d1, d2.
3	Drying of solids using different models of dryers such as oven , spray drier + evaluation of drying efficiency by determination of moist content and loss on drying.	**1**	2	a1,a2,b2, c1, c2, d1, d2.
4	Drying of thermolabile materials using dryers under vacuum and freeze dryer	**1**	2	a1,a2,b2, c1, c2, d1, d2
5	particle size reduction (milling) using different models of millers such as hammer-mill, cutter mill, ball-mill and colloidal mill + evaluation of milling efficiency by determination of particle size of powder	**1**	2	a1,a2,b2, c1, c2, d1, d2.
6	particle size enlargement (producing granules from powder) using different models of equipment (High shear granulator, extruders…ect)	**1**	2	a1,a2,b1, c1, c2, d1, d2.
7	Mixing of solids using different models of mixer such as V-mixer, cone-mixer + evaluation of mixing efficiency using UV or HPLC method.	**2**	4	a1,a2,b1,b2, c1, c2, d1, d2.
8	Mixing of liquids and semisolids using suitable mixers + evaluation of mixing efficiency using UV or HPLC method. .	**2**	4	a1,a2,b2, c1, c2, d1, d2.
9	Filling of liquids Using suitable filter aid and Buchner filter	**1**	2	a1,a2,b2, c1, c2, d1, d2.
10	Final Exam	**1**	2	a1,a2,b1,b2, c1, c2, d1, d2.
Number of Weeks /and Contact Hours Per Semester		**14**	**28**	

VI. Teaching strategies of the course:
▪ Lectures ▪ Groups discussion. ▪ Discussions and Training ▪ Practical presentations

- Field visits
- Problem solving
- Practical in Lab
- Cooperative learning.
- Simulation Group discussions
- Self – learning
- Inductive and deductive

VII. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Report for different terminology of industrial	**a1, a2, b1, b2, c1, c2, d1, d2**	10	5
2	Presentation after visiting pharmaceutical factory	**a1, a2, b1, b2, c1, c2, d1.**	12	5

VIII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Assignments	10, 12	10	10%	a1, a2, b1, b2, c1, c2, d1, d2
2	Mid exam of theoretical	8	10	10%	a1, a2, c1, b1
3	Practical lab work	13	10	10%	a2, b2, c1, c2, d1, d2
	Final Exam (Practical)	15	30	30%	a2, b2, c1, c2, d1, d2
5	Final exam of theoretical part (written exam)	16	40	40%	a1, a2, b1, b2, c1, c2, d1, d2
Total			100	100%	

IX. Learning Resources
1- Required Textbook(s) (maximum two).
1- Badger, WL. and Banchero, J.T., (1995). Introduction to chemical engineering, McGRAW- HILL book publishing company INC., KOGAKUSHA company, LTD Tokyo. 2- Warren McCabe. Julian Smith, Peter Harriot (2000). Unit Operations, McGraw-Hill Publishing science. New Delhi, sixth edition..
2- Essential References.
1- Williams and Wilkins (2005). Remington; the Science and Practice of Pharmacy (2first edition). Publisher: Lippincott. 2- Bhatt NB, Panchal VM, Panchal VM, (2005). Machine Drawing. Charotar Publishing House PVT Ltd.
3- Electronic Materials and Web Sites *etc*.

X. Course Policies:	
1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** - Assignments and projects will be assessed individually unless the teacher request for group work
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course

6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:** **-**

Template for Course Plan (Syllabus) of Industrial Pharmacy

I. Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location& Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

II.	Course Identification and General Information:					
1	Course Title:	Industrial Pharmacy				
2	Course Code & Number:	PHA459				
3	Credit hours:	C.H				C.H
		Seminar	Seminar	Seminar	Seminar	Seminar
4	Study level/ semester at which this course is offered:	4th year / 2nd semester				
5	Pre –requisite (if any):	Pharmaceutics (3)				
6	Co –requisite (if any):	none				
7	Program (s) in which the course is offered:	B Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	Language of teaching the course:	English				
9	Study System	Semester				
10	Mode of delivery:	Regular				
11	Location of teaching the course:	Al-Saeed University campus				

III.	Course Description:

This course aims to provide the students basic concepts involved in the manufacture of various drug dosage forms on large scale efficiently and economically. Moreover, they will be provided with the essential unit operation involved in the production of pharmaceuticals such as heat transfer, evaporation, drying, size reduction and separation, extraction, filtration, centrifugation, size enlargement and mixing process. The course also includes practical part that will help students to apply their learned knowledge.

IV.	Course Objectives:

The aim of the course is to

1. Provide the students with the necessary knowledge in the area of pharmaceutical technology.
2. Help the student to acquire the fundamentals and importance of some unit operations process in the drug development and manufacturing.

V.	Intended learning outcomes (ILOs) of the course:

1. Explain the principles of the operation methods of various equipment which used for manufacturing pharmaceutical product.
2. Describe the different process for developing and manufacturing raw materials.
3. Select suitable equipment required for operation process during pharmaceutical manufacturing.
4. Apply an appropriate engineering processes before manufacturing different dosage forms.
5. List the different equipment utilized to carry out different unit operations.
6. Employ developing equipment required for mixing, extraction, drying and other operation process.
7. Communicate effectively and behave in discipline with colleagues.
8. Cooperate and work in a team.

VI. Course Content:				
A – Theoretical Aspect:				
Order	**Units/Topics List**	**Sub Topics List**	**Week Due**	**Week Due**
1	Heat transfer and Flow of heat	- Classification of heat flow process. - Overall coefficient of heat transfer. - Mechanisms of heat transfer, conduction, convection and radiation. - Steam and steam driers -Design of heating equipment (Heat exchanger):	1st week	4
		-Tubular heaters - Finely tube heat exchanger. -Plate heat exchanger -Spiral heat exchanger -Fouling: define, causes. overcome	2nd week	
2	Drying	• Introduction, - Terminologies, - Theory of drying loss on drying and moisture content, equilibrium moisture content. - Mechanism of drying and Factors effecting drying - Classification of dryers • Dryers for solid materials. 4- Convectional dryers (Tray dryer and Fluid bed dryer) 5- Conduction dryers (Vacuum oven dryer	3rd week	4

		6- and Vacuum Tumbler oven dryer). 7- Radiation dryers (IR dryer and Microwave radiation dryer) • Dryers for dilute solutions and suspensions. Examples: - Drum dryer - Spray dryer • Principles of freeze drying, freeze dryers.	4th week	
3	Evaporation	❖ General principals of evaporation. ❖ Factor affecting evaporation ❖ Classification of Evaporators: - jacketed kettles - tube evaporators, ❖ Forced circulation evaporator. ❖ Multiple effect evaporation. ❖ Evaporator accessories- Trap and cyclone. ❖ Evaporation problems	5th week	2
4	Mixing process	Introduction to mixing - Factors effecting mixing, - Fundamentals and mechanism. Classification of mixture ❖ Solid mixers 4- Tumbler mixer examples (Drum, cube, double cone, Slant and V-shaped mixer) 5- Agitator mixer examples (Horizontal Ribbon and Vertical Ribbon) 6- Special mixer (Disona, pneumatic and zenkheta mixer)	6th week	4
		❖ Semisolid mixer • Beater mixers • Kneaders • Triple roll • Extruders ❖ Liquid mixers, ❖ Type of liquid ❖ Factor effect on liquid mixing	7th week	

		❖ Vortex ❖ Type of impellers 5- Paddles 6- Turbines 7- Propellers 8- Special mixer for liqued		
5	Mid-term Exam		8th week	2
6	Size enlargement	❖ Methods and mechanisms of granule formation. ❖ Reasons for size enlargement. ❖ Pharmaceutical granulation equipment: ❖ High speed mixer granulator, Oscillating granulator. ❖ Extruder.	9th week	2
7	Size reduction	❖ Definitions, Important of milling, ❖ Factors effecting size reduction ❖ Advantage and disadvantage of milling. ❖ Theory and mechanisms of size reduction. ❖ Classification of size reduction equipment:	10th week	4
		❖ Intermediate size reduction: • Hammer mill • Cuter mill • Edge end mill ❖ Fine size reduction: • Fluid energy mill • Ball mill • Oscillator mill ❖ Colloidal mill	11th week	
8	Filtration	❖ Definitions, Important of filtration ❖ Factors effecting filtration ❖ Advantage and disadvantage	12th week	2

		of filtration ❖ Methods of filtration: ❖ Gravity filter ❖ Pressure filter ❖ Drum filter ❖ Paper Filter ❖ Select suitable filter ❖ Filter Aids: Define, Important ❖ Types of filter aid: ❖ Cotton ❖ Nylon ❖ Synthetic filter aid		
9	Distillation	❖ Definition, Important of distillation in pharmacy ❖ Type of distillation: (a) Destructive distillation, (b) Vacuum distillation, (c) Steam distillation d) Fractional distillation.	13th week	2
10	Extraction process	❖ Extraction: definition, uses, factor affecting extraction ❖ Type of extraction: - Liquid/ solid extraction • Percolation • Maceration - Liquid/ liquid extraction • Plate baffle column • Backed column • Spray column • Schiable column	14th week	2
11	Crystallization	- Definition, uses, factor affecting crystallization. - Classification, batch crystallizers, simple vacuum crystallizers. - Nucleation and crystal growth - critical humidity prevention of caking, material and energy balances	15th week	2
12	FINAL – EXAM		16th week	2

Number of Weeks /and Units Per Semester		16	32
B. Practical Aspect			
Order	**Practical / Exercises/ Tutorials topics**	**Week Due**	**Contact Hours**
1	Extract Active constitutes from some natural material using suitable solvent and economic methods for extraction.	**1st + 2nd week**	4
2	Evaporation the solvent of extract to produced concentrate product by using Rotary Evaporation and other evaporation process.	3rd + 4th week	4
3	Drying of solids using different models of dryers such as oven , spray drier + evaluation of drying efficiency by determination of moist content and loss on drying.	5th week	2
4	Drying of thermolabile materials using dryers under vacuum and freeze dryer	6th week	2
5	particle size reduction (milling) using different models of millers such as hammer-mill, cutter mill, ball-mill and colloidal mill + evaluation of milling efficiency by determination of particle size of powder	**7th week**	2
6	particle size enlargement (producing granules from powder) using different models of equipment (High shear granulator, extruders…ect)	8th week	2
7	Mixing of solids using different models of mixer such as V-mixer, cone-mixer + evaluation of mixing efficiency using UV or HPLC method.	9th +10th weeks	4
8	Mixing of liquids and semisolids using suitable mixers + evaluation of mixing efficiency using UV or HPLC method. .	11th + 12th week	4
9	Filling of liquids Using suitable filter aid and Buchner filter	13th week	2
10	Final Exam	14th week	2
Number of Weeks /and Contact Hours Per Semester		**14**	**28**

VII.	Teaching strategies of the course:

- Lectures
- Groups discussion.
- Discussions and Training
- Practical presentations
- Field visits
- Problem solving
- Practical in Lab
- Cooperative learning.
- Simulation Group discussions
- Self – learning
- Inductive and deductive

VIII.	Assignments:		
No	**Assignments**	**Week Due**	**Mark**
1	Report for different terminology of industrial	10	5
2	Presentation after visiting pharmaceutical factory	12	5

IX.	Schedule of Assessment Tasks for Students During the Semester:			
No.	**Assessment Method**	**Week Due**	**Mark**	**Proportion of Final Assessment**
1	Assignments	10, 12	10	10%
2	Mid exam of theoretical	8	10	10%
3	Practical lab work	13	10	10%
4	Final Exam (Practical)	14	30	30%
5	Final exam of theoretical part (written exam)	16	40	40%
Total			100	100%

X.	Learning Resources
1- Required Textbook(s) (maximum two).	
1. Badger, WL. and Banchero, J.T., (1995). Introduction to chemical engineering, McGRAW- HILL book publishing company INC., KOGAKUSHA company, LTD Tokyo. 2. Warren McCabe. Julian Smith, Peter Harriot (2000). Unit Operations, McGraw-Hill Publishing science. New Delhi, sixth edition..	
2- Essential References.	
1. Williams and Wilkins (2005). Remington; the Science and Practice of Pharmacy (2first edition). Publisher: Lippincott. 2. Bhatt NB, Panchal VM, Panchal VM, (2005). Machine Drawing. Charotar Publishing House PVT Ltd.	
3- Electronic Materials and Web Sites *etc*.	

XI.	Course Policies:
1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam.
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** - Assignments and projects will be assessed individually unless the teacher request for group work.
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course.
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the faculty rules.

Course Specification of Pharmacology (4)

I.	Course Identification and General Information:					
1	**Course Title:**	**Pharmacology (4)**				
2	**Course Code & Number:**	**PHA465**				
3	**Credit hours:**	C.H				Total
		Th.	Seminar	practical	Training.	
		2				**2**
4	**Study level/ semester at which this course is offered:**	fourth level, second semester				
5	**Pre –requisite (if any):**	**Pharmacology (3)**				
6	**Co –requisite (if any):**	None				
7	**Program (s) in which the course is offered:**	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	**Language of teaching the course:**	English Language				
9	**Study System**	Semester				
10	**Mode of delivery:**	Regular				
11	**Location of teaching the course:**	University				
12	**Prepared By:**	**Dr. Hamad Mahmood Alshabi**				

II.	Course Description:
	This course covers the pharmacology of chemotherapeutic drugs for infections and cancer. This course includes drugs' mechanism of action, pharmacokinetics, clinically significant side effects & drug interactions, contraindications and clinical uses.

III.	Course Objectives:
	Upon successful completion of the course, the students will be able to: 1) Discuss the mechanism of actions, indications, pharmacokinetics, adverse effects for the aforementioned diseases

2) Recognize interaction with others drugs, precautions, and contraindications of drugs used for the aforementioned diseases.

IV.	**Course Intended learning outcomes (CILOs) of the course:** Upon successful completion of this course, the student should be able to:	WRITE Symbol and number of PILOs
a.1	Recognize the basic principle of chemotherapy, and drug selection in infections and cancer.	**A1, A3**
a.2	Identify the Pharmacological properties (action, mechanisms of action, therapeutic uses, dosage, contraindications, ADRs and drug interactions, toxicity of the chemotherapeutic drugs for infections and cancer.	**A3**
b.1	Differentiate between the major drug classes and between members of each drug class in relation to their mechanism of action, pharmacokinetic parameters, efficacy and adverse effects.	**B1**
b.2	Select optimum therapeutic agents based on their binding sites, molecular mechanism of action and pharmacokinetic parameters.	**B3**
c.1	Recommend the most appropriate therapy that eliminates drug interaction, reduces side effects and resistance.	**C2**
c.2	Advise patients and other health professionals on proper use of medicines and their possible adverse effects.	**C4**
d.1	Demonstrate critical thinking, decision making, team working, life-long learning and communication skills.	**D1, D2**
d.2	Utilize different resources of pharmacology (books, professional sites and scientific journals) to get information about the drugs.	**D3**

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	**Teaching strategies**	**Assessment Strategies**
a1. Recognize the basic principle of chemotherapy, and drug selection in infections and cancer.	- Interactive lectures - Groups discussion.	- Written Exams (midterm and final)

a2. Identify the Pharmacological properties (action, mechanisms of action, therapeutic uses, dosage, contraindications, ADRs and drug interactions, toxicity of the chemotherapeutic drugs for infections and cancer.	- Case-Study - Assignments	- Quizzes - Multiple Choice Questions (MCQs) - Assignments **&** Coursework Activities

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	**Teaching strategies**	**Assessment Strategies**
b1. Differentiate between the major drug classes and between members of each drug class in relation to their mechanism of action, pharmacokinetic parameters, efficacy and adverse effects.	- Interactive lectures - Groups discussion. - Problem-solving learning. - Assignments - Simulation	- Written Exams (midterm and final) - Quizzes - Multiple Choice Questions (MCQs) - Assignments **&** Coursework Activities - Problem-solving exercises.
b2. Select optimum therapeutic agents based on their binding sites, molecular mechanism of action and pharmacokinetic parameters.		

(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	**Teaching strategies**	**Assessment Strategies**
c1. Recommend the most appropriate therapy that eliminates drug interaction, reduces side effects and resistance.	- Problem-solving learning - Case-Study - Simulation - Discussion	- Problem-solving exercises. - Multiple Choice Questions (MCQs)
c2. Advise patients and other health professionals on proper use of medicines and their possible adverse effects.		
(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	**Teaching strategies**	**Assessment Strategies**

d1. Demonstrate critical thinking, decision making, team working, life-long learning and communication skills.	- Cooperative & Self – learning. - Problem-solving learning. - Assignments	- Oral Presentation - Assignments & Coursework Activities - Reports of Assignments - Problem Solving Exercise
d2. Utilize different resources of pharmacology (books, professional sites and scientific journals) to get information about the drugs.		

V. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	contact hours
1	**General Principles of Antimicrobial Therapy**	a1, d2	- Definitions - Selection of Antimicrobial Agents - Determination of antimicrobial susceptibility - Bacteriostatic versus bactericidal drugs - Determinants of Rational Dosing - Chemotherapeutic Spectra - Types and goals of antimicrobial therapy - Resistance to antimicrobial agents	**1**	**2**
2	**Chemotherapeutic Drugs Bacterial Infections** (Antibacterial)	a2, b1, b2 c1, c2, d1, d2	- Beta-Lactam (Penicillins, Cephalosporin, Monobactams, Carbapenems) & - Other Cell Wall Membrane-Active Antibiotics. - Protein synthesis inhibitors: Tetracyclines, Macrolides, Clindamycin, Chloramphenicol, Streptogramins, Oxazolidinones, Aminoglycosides, Spectinomycin and - Miscellaneous Antibacterial Agents.	**4**	**8**

			- Sulfonamides, Trimethoprim, & Quinolones. - Antimycobacterial Drugs. - Antiseptics and disinfectants		
3	**Chemotherapeutic Drugs for Fungi and Viruses Infections**	a2, b1, b2 c1, c2, d1, d2	- Antifungal Agents. - Antiviral Agents.	**2**	**4**
4		a1, a2, b1, b2, c1, c2	**Mid-term Exam**	**1**	**2**
	Chemotherapeutic Drugs for Parasitic Infections	a2, b1, b2 c1, c2, d1, d2	**Antiprotozoals** - Antamoebics and antigiardials - Anti-leishmanials and antitoxoplasmosis - Antimalarials **Anthelmintics**	**3**	**6**
5	**Chemotherapeutic Drugs for Cancer (Anticancer; Antineoplastic)**	a2, b1, b2 c1, c2, d1, d2	- Antimetabolites - Alkylating agents - Natural products - Hormones and hormones Anatgonists - Radioactive isotopes - Miscellaneous	**4**	**8**
		a2, b1, b2 c1, c2	**Final Term exam**	**1**	**2**
Number of Weeks /and Units Per Semester				**16**	**32**

VI. Teaching strategies of the course:
- Interactive lectures - Case-Study - Problem-solving learning. - Simulation - Discussion - Cooperative & Self – learning. - Assignments

VII.	Assignments:			
No	**Assignments**	**Aligned CILOs (symbols)**	**Week Due**	**Mark**
1	Participation, Homework Assignments	**a2, b1, b2, c1, c2, d1, d2**	weekly	**3**
2	Exercises, Reports	**c1-c2, d1-d2**	weekly	**3**
	Total Score			**6**

VIII.	Schedule of Assessment Tasks for Students During the Semester:				
No.	**Assessment Method**	**Week Due**	**Mark**	**Proportion of Final Assessment**	**Aligned Course Learning Outcomes**
1	Tasks and Assignments	**1-14**	**6**	**6%**	a2, b1, b2, c1, c2, d1, d2
2	Quizzes 1	**W6**	2	2%	a1, a2, b1
3	Mid-term exam	**W8**	20	20%	a1, a2, b1, b2, c1, c2
4	Quizzes 2	**W12**	2	2%	a1, a2, b1
5	Final exam	**W16**	70	70%	a2, b1, b2 c1, c2
6	**Total**		100	100%	

IX.	Learning Resources:
1- Required Textbook(s) (maximum two).	
	1- Katzung, B.G., (2018). Basic & Clinical Pharmacology, 14th edition, the Mc Grow Hill Companies. 2- Lippincott's illustrated reviews, 2019, Pharmacology, 7th edition, Wolters Kluwer.
2- Essential References.	
	1- James M. Ritter , Rod J. Flower, 2020, Rang and Dale Pharmacology. 9th edition, Churchill Livingstone Elsevier. 2- **Laurence L. Brunton,** 2018. Goodman and Gillman's Pharmacological Basis of Therapeutics: 13th

	edition, McGraw-Hill Education.
3- Electronic Materials and Web Sites *etc.*	
	1- Website: Pharmacology Animation Book, http://animationbook.net 2- www.pharmacology2000.com/learning2.htm 3- www.pharmacology.com

X.	**Course Policies:**
1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** - Assignments and projects will be assessed individually unless the teacher request for group work
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the faculty rules.

Template for Course Plan (Syllabus) of Pharmacology (4)

I. Information about Faculty Member Responsible for the Course:							
Name of Faculty Member		Office Hours					
Location& Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

II.	Course Identification and General Information:					
1	Course Title:	Pharmacology (4)				
2	Course Code & Number:	PHA465				
3	Credit hours:	C.H				Total
		Th.	Seminar	practical	Training.	
		2				2
4	Study level/ semester at which this course is offered:	fourth level, second semester				
5	Pre –requisite (if any):	Pharmacology (3)				
6	Co –requisite (if any):	none				
7	Program (s) in which the course is offered:	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	Language of teaching the course:	English Language				
9	Study System	Semester				
10	Mode of delivery:	Regular				
11	Location of teaching the course:	University				

III. Course Description:
This course covers the pharmacology of chemotherapeutic drugs for infections and cancer. This course includes drugs' mechanism of action, pharmacokinetics, clinically significant side effects & drug interactions, contraindications and clinical uses.

IV. Course Objectives:
Upon successful completion of the course, the students will be able to: 1) Discuss the mechanism of actions, indications, pharmacokinetics, adverse effects for the aforementioned diseases 2) Recognize interaction with others drugs, precautions, and contraindications of drugs used for the aforementioned diseases.

V. Intended learning outcomes (ILOs) of the course:
Upon successful completion of this course, the student should be able to:
1- Recognize the basic principle of chemotherapy, and drug selection in infections and cancer. 2- Identify the Pharmacological properties (action, mechanisms of action, therapeutic uses, dosage, contraindications, ADRs and drug interactions, toxicity of the chemotherapeutic drugs for infections and cancer . 3- Differentiate between the major drug classes and between members of each drug class in relation to their mechanism of action, pharmacokinetic parameters, efficacy and adverse effects. 4- Select optimum therapeutic agents based on their binding sites, molecular mechanism of action and pharmacokinetic parameters. 5- Recommend the most appropriate therapy that eliminates drug interaction, reduces side effects and resistance. 6- Advise patients and other health professionals on proper use of medicines and their possible adverse effects. 7- Demonstrate critical thinking, decision making, team working, life-long learning and communication skills. 8- Utilize different resources of pharmacology (books, professional sites and scientific journals) to get information about the drugs.

VI. Course Content:			
A – Theoretical Aspect:			
Order	Topics List	Week Due	Contact Hours

1	**General Principles of Antimicrobial Therapy:** - Definitions - Selection of Antimicrobial Agents - Determination of antimicrobial susceptibility - Bacteriostatic versus bactericidal drugs - Determinants of Rational Dosing - Chemotherapeutic Spectra - Types and goals of antimicrobial therapy - Resistance to antimicrobial agents	1	2
	Chemotherapeutic Drugs Bacterial Infections (Antibacterial): - Beta-Lactam (Penicillins, Cephalosporin, Monobactams, Carbapenems) & - Other Cell Wall Membrane-Active Antibiotics. - Protein synthesis inhibitors: Tetracyclines, Macrolides, Clindamycin, Chloramphenicol, Streptogramins, Oxazolidinones, Aminoglycosides, Spectinomycin and - Miscellaneous Antibacterial Agents. - Sulfonamides, Trimethoprim, & Quinolones. - Antimycobacterial Drugs. - Antiseptics and disinfectants	2, 3, 4, 5	8
	Chemotherapeutic Drugs for Fungi and Viruses Infections - Antifungal Agents. - Antiviral Agents.	6, 7	4
	Mid-term Exam	8	2
	Chemotherapeutic Drugs for Parasitic Infections **Antiprotozoals** - Antamoebics and	9, 10, 11	6

	antigiardials - Anti-leishmanials and antitoxoplasmosis - Antimalarials **Anthelmintics**		
	Chemotherapeutic Drugs for Cancer **(Anticancer; Antineoplastic)** - Antimetabolites - Alkylating agents - Natural products - Hormones and hormones Anatgonists - Radioactive isotopes - Miscellaneous	12, 13, 14, 15	8
	Final Term exam	16	2
Number of Weeks /and Units Per Semester		**16**	**32**

VII. Teaching strategies of the course:

- Lectures and Groups discussion.
- Computer based teaching and learning.
- Problem-solving learning.
- Brainstorming.
- Cooperative & Self – learning.

VIII. Assignments:

No	Assignments	Week Due	Mark
1	Participation, Homework Assignments	weekly	**3**
2	Exercises, Reports	weekly	**3**
	Total Score		**6**

IX. Schedule of Assessment Tasks for Students During the Semester:				
Assessment	**Type of Assessment Tasks**	**Week Due**	**Mark**	**Proportion of Final Assessment**
1	Tasks and Assignments	**1-14**	**6**	**6%**
2	Quizzes 1	**W6**	2	2%
3	Mid-term exam	**W8**	20	20%
4	Quizzes 2	**W12**	2	2%
5	Final exam	**W16**	70	70%
6	**Total**		100	100%

X. Learning Resources:	
1- Required Textbook(s) (maximum two).	
	1- Katzung, B.G., (2018). Basic & Clinical Pharmacology, 14th edition, the Mc Grow Hill Companies. 2- Lippincott's illustrated reviews, 2019, Pharmacology, 7th edition, Wolters Kluwer.
2- Essential References.	
	1- James M. Ritter , Rod J. Flower, 2020, Rang and Dale Pharmacology. 9th edition, Churchill Livingstone Elsevier. 2- **Laurence L. Brunton,** 2018. Goodman and Gillman's Pharmacological Basis of Therapeutics: 13th edition, McGraw-Hill Education.
3- Electronic Materials and Web Sites *etc*.	
	1- Website: Pharmacology Animation Book, http://animationbook.net 2- www.pharmacology2000.com/learning2.htm 3- www.pharmacology.com

XI.	Course Policies:
1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam.
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** - Assignments and projects will be assessed individually unless the teacher request for group work.
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course.
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:**

Course Specification of toxicology

I.	Course Identification and General Information:					
1	Course Title:	Toxicology				
2	Course Code & Number:	PHA466				
3	Credit hours:	C.H				Total
		Th.	Seminar	practical	Training.	
		2				2
4	Study level/ semester at which this course is offered:	Fourth level, second semester				
5	Pre –requisite (if any):	Pharmacology (3)				
6	Co –requisite (if any):					
7	Program (s) in which the course is offered:	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	Language of teaching the course:	English Language				
9	Study System	Semester				
10	Mode of delivery:	Regular				
11	Location of teaching the course:	University				
12	Prepared By:	Dr. Hamad Mahmood Alshabi				

II.	Course Description:
	This course presents the basic principles of toxicology. The course also gives a general clinical approach in the management of poisoned patients. Poisoning with common groups of chemicals (air pollutants, industrial and household poisons, heavy metals, pesticides, animal and plant poisons, and common drugs) will be presented including, mechanism of toxicity, sources of exposure, major clinical manifestation, diagnosis and methods of treatment.

III. Course Objectives:
The course intends to: 1 -Introduce the students of pharmacy to the basic principles of toxicology 2 -Familiarize the students with the general approach in the management of poisoned patients. 3- Introduce the student to sources of human exposure and Poisoning with common groups of chemicals.

IV.	Course Intended learning outcomes (CILOs) of the course	WRITE Symbol and number of PILOs
a.1	Describe the basic principles of toxicology, toxicokinetic, toxicodynamic and management of poisoning.	**A3**
a.2	Describe the drug and substance misuse and abuse from toxicological perspectives.	
a.3	List the toxic profile of various drugs and toxic substances including types, sources, mechanism of toxicity, analysis, clinical presentations, management.	
b.1	Differentiate between different toxic agents regarding their symptoms, as well as their main lines of toxicity treatment.	**B1, B3**
b.2	Determine strategies that prevent toxic exposure, substance abuse and chemical dependency.	**B4**
c.1	Provide knowledge of the most commonly encountered antidotes, their mechanisms of actions, routes of administration and any special precautions.	**C2, C4**
d.1	Demonstrate the ability to utilize different resources toxicology (books, professional sites and scientific journals) and life-long learning skills.	**D2, D3**

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	**Teaching strategies**	**Assessment Strategies**
a1. Describe the basic principles of toxicology, toxicokinetic, toxicodynamic and management of poisoning.	- Lectures - Discussion - Assignments - Self – learning.	- In-class participation - Quizzes - Assignments - Written exam.
a2. Describe the drug and substance misuse and abuse from toxicological perspectives.		
a3. List the toxic profile of various drugs and toxic substances including types, sources, mechanism of toxicity, analysis, clinical presentations, management.		

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	**Teaching strategies**	**Assessment Strategies**
b1. Differentiate between different toxic agents regarding their symptoms, as well as their main lines of toxicity treatment.	- Lectures and Groups discussion. - Problem-based learning (PBL). - Brainstorming.	- In-class participation - Quizzes - Problem solving and case study report. - Written exam.
b2. Determine strategies that prevent toxic exposure, substance abuse and chemical dependency.		

(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	**Teaching strategies**	**Assessment Strategies**
c1- Provide knowledge of the most commonly encountered antidotes, their mechanisms of actions, routes of administration and any special precautions .	- Brainstorming. - Problem-based learning.	Problem solving and case study report.

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	**Teaching strategies**	**Assessment Strategies**
d1- Demonstrate the ability to utilize different resources toxicology (books, professional sites and scientific journals) and life-long learning skills.	- Group discussions. - Problem-based learning. - Cooperative & Self – learning.	- Oral Presentation & discussion - Homework Evaluation. - Reports

V. Course Content:					
A – Theoretical Aspect:					
Order	**Units/Topics List**	**Learning Outcomes**	**Sub Topics List**	**Number of Weeks**	**contact hours**
1	**Principles of Toxicology**	a1, b1, d1, d2	- Definition and terminology - Review of relevant toxicokinetic principles - Review of relevant toxicodynamic principles - Factors that influence toxicity	**2**	**4**
2	**General approaches to the management of poisoned patients:**	a1, a3, b1, c1 d1	- Evaluation of the patient - Initial assessment - Certain toxicokinetics - Pathophysiologyical mechanisms of toxicants - Identification of patient and toxicant - Decontamination - Inhalation exposure - Ocular exposure	**2**	**4**

			- GIT decontamination - Enhancement of elimination - Extracorporeal methods - Administration of antidote, Supportive care and clinical follow-up.		
3	**Toxidromes**	a1, a3, b1, d1	Concept of toxidromes and their significance in the diagnosis of poisoning. - commonly encountered toxidromes.	**1**	**2**
4	**Plant poisons**	a3, b1, b2, c1 d1	Toxicity of common poisonous plants	**1**	**2**
5		a1, a3, b1, b2, c1	**Mid-Term Exam**	**1**	**2**
6	**Food and animal poisoning**	a3, b1, b2, c1, d1	- Food poisoning - Snake and scorpion poisoning	**1**	**2**
7	**Industrial and household toxicology**	a3, b1, b2, c1, d1	Toxicity of: - Nitrates and nitrites - Carbon monoxide - Cyanide - Pesticides - corrosives	**3**	6

8	**Heavy Metals**	a3, b1, b2, c1, d1	Toxicity of: - Lead, Iron, arsenic, mercury, others. Chelating agents	**1**	2
9	**Clinical toxicology**	a3, b1, b2, c1, d1	Toxicity of: - Salicylates - Paracetamol (Acetaminophen), digitalis, others	**1**	2
10	**Drugs of abuse:**	a2, a3, b1, b2, c1, d1	- Introduction - Opioids - Alcohol intoxication - Nicotine	**2**	4
		a1, a2, a3, b1, b2, c1	**Final Term exam**	**1**	**2**
Number of Weeks /and Units Per Semester				**16**	**32**

VI. Teaching strategies of the course:

- Lectures
- Discussion
- Assignments
- Cooperative & Self – learning.
- Problem-based learning (PBL).
- Brainstorming.

VII. Assignments:

No	Assignments	Aligned CILOs (symbols)	Week Due	Mark
1	Participation, Homework Assignments	**a1-a3, b1-b2, d1**	weekly	**2**
2	Exercises, Reports	**b1, b2, c1, d1**	weekly	**3**
	Total Score			**5**

VIII. Schedule of Assessment Tasks for Students During the Semester:					
No.	**Assessment Method**	**Week Due**	**Mark**	**Proportion of Final Assessment**	**Aligned Course Learning Outcomes**
1	Tasks and Assignments	**1-14**	**5**	**5%**	**a1-a3, b1-b2, c1, d1**
2	Quizzes 1	**W6**	2.5	2.5%	**a1, a3, b1, d1**
3	Mid-term exam	**W7**	20	20%	a1, a3, b1, b2, c1
4	Quizzes 2	**W12**	2.5	2.5%	a1, a2, a3, b1, d1
5	Final exam	**W16**	70	70%	a1, a2, a3, b1, b2, c1
6	**Total**		100	100%	

IX. Learning Resources:
1- Required Textbook(s) (maximum two).
1- Klaassen, C. D., & Watkins, J. B. (2015). Casarett & Doull's essentials of toxicology. McGraw Hill Professional. 2- Katzung, B.G., (2018). Basic & Clinical Pharmacology, 14th edition, the Mc Grow Hill Companies.
2- Essential References.
1- Curtis Klaassen. 2013. Casarett & Doull's Toxicology: The Basic Science of Poisons, 8th edition, McGraw-Hill Education. 2- Kent R. Olson. 2012. Poisoning and Drug Overdose. 6th Ed.
3- Electronic Materials and Web Sites *etc*.

X. Course Policies:	
1	**Class Attendance:**

	- At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** - Assignments and projects will be assessed individually unless the teacher request for group work
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:** -

Template for Course Plan (Syllabus) of Toxicology

I. - Information about Faculty Member Responsible for the Course:								
Name of Faculty Member		Office Hours						
Location& Telephone No.		SAT	SUN	MON	TUE	WED	THU	
E-mail								

II.	Course Identification and General Information:					
1	Course Title:	Toxicology				
2	Course Code & Number:	PHA466				
3	Credit hours:	C.H				Total
		Th.	Seminar	practical	Training.	
		2				2
4	Study level/ semester at which this course is offered:	Fourth level, second semester				
5	Pre –requisite (if any):	Pharmacology (3)				
6	Co –requisite (if any):					
7	Program (s) in which the course is offered:	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	Language of teaching the course:	English Language				
9	Study System	Semester				
10	Mode of delivery:	Regular				
11	Location of teaching the course:	University				

III. Course Description:

This course presents the basic principles of toxicology. The course also gives a general clinical approach in the management of poisoned patients. Poisoning with common groups of chemicals (air pollutants, industrial and household poisons, heavy metals, pesticides, animal and plant poisons, and common drugs) will be presented including, mechanism of toxicity, sources of exposure, major clinical manifestation, diagnosis and methods of treatment.

IV. Course Objectives:

The course intends to:

1 -Introduce the students of pharmacy to the basic principles of toxicology

2 -Familiarize the students with the general approach in the management of poisoned patients.

3- Introduce the student to sources of human exposure and Poisoning with common groups of chemicals.

V. Intended learning outcomes (ILOs) of the course:

Upon successful completion of this course, the student should be able to:

1- Describe the basic principles of toxicology, toxicokinetic, toxicodynamic and management of poisoning.
2- Describe the drug and substance misuse and abuse from toxicological perspectives .
3- List the toxic profile of various drugs and toxic substances including types, sources, mechanism of toxicity, analysis, clinical presentations, management .
4- Differentiate between different toxic agents regarding their symptoms, as well as their main lines of toxicity treatment .
5- Determine strategies that prevent toxic exposure, substance abuse and chemical dependency .
6- Provide knowledge of the most commonly encountered antidotes, their mechanisms of actions, routes of administration and any special precautions .
7- Demonstrate the ability to utilize different resources toxicology (books, professional sites and scientific journals) and life-long learning skills.

VI. Course Content:

A – Theoretical Aspect:

Order	Topics List	Week Due	Contact Hours
1	**Principles of Toxicology:** - Definition and terminology	1, 2	4

	- Review of relevant toxicokinetic principles - Review of relevant toxicodynamic principles - Factors that influence toxicity		
2	**General approaches to the management of poisoned patients:** - Evaluation of the patient - Initial assessment - Certain toxicokinetics - Pathophysiologyical mechanisms of toxicants - Identification of patient and toxicant - Decontamination - Inhalation exposure - Ocular exposure - GIT decontamination - Enhancement of elimination - Extracorporeal methods - Administration of antidote, Supportive care and clinical follow-up.	3, 4	4
3	**Toxidromes:** - Concept of toxidromes and their significance in the diagnosis of poisoning. - commonly encountered toxidromes.	5	2
4	**Plant poisons:** Toxicity of common poisonous plants	6	2
5	**Mid-Term Exam**	7	2
6	**Food and animal poisoning:** - Food poisoning - Snake and scorpion poisoning	8	2

7	**Industrial and household toxicology:** Toxicity of: - Nitrates and nitrites - Carbon monoxide - Cyanide - Pesticides - corrosives	9, 10, 11	6
8	**Heavy Metals:** Toxicity of: - Lead, Iron, arsenic, mercury, others. Chelating agents	12	2
9	**Clinical toxicology:** Toxicity of: - Salicylates - Paracetamol (Acetaminophen), digitalis, others	13	2
10	**Drugs of abuse:** - Introduction - Opioids - Alcohol intoxication - Nicotine	14, 15	4
11	**Final Term exam**	16	2
Number of Weeks /and Units Per Semester		**16**	**32**

VII. Teaching strategies of the course:
- Lectures - Discussion - Assignments - Cooperative & Self – learning. - Problem-based learning (PBL).

- Brainstorming.

VIII. Assignments:

No	Assignments	Week Due	Mark
1	Participation, Homework Assignments	weekly	**2**
2	Exercises, Reports	weekly	**3**
	Total Score		**5**

IX. Schedule of Assessment Tasks for Students During the Semester:

Assessment	Type of Assessment Tasks	Week Due	Mark	Proportion of Final Assessment
1	Tasks and Assignments	**1-14**	**5**	**5%**
2	Quizzes 1	**W6**	2.5	2.5%
3	Mid-term exam	**W7**	20	20%
4	Quizzes 2	**W12**	2.5	2.5%
5	Final exam	**W16**	70	70%
6	**Total**		100	100%

X. Learning Resources:

1- Required Textbook(s) (maximum two).

1- Klaassen, C. D., & Watkins, J. B. (2015). Casarett & Doull's essentials of toxicology.

McGraw Hill Professional.

2- Katzung, B.G., (2018). Basic & Clinical Pharmacology, 14th edition, the Mc Grow Hill Companies.

2- Essential References.

1- Curtis Klaassen. 2013. Casarett & Doull's Toxicology: The Basic Science of Poisons, 8th edition, McGraw-Hill Education.

	2- Kent R. Olson. 2012. Poisoning and Drug Overdose. 6th Ed.
3- Electronic Materials and Web Sites *etc*.	

	XI. Course Policies:
1	**Class Attendance:** **-** At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam.
2	**Tardy:** **-** any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** **-** any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** - Assignments and projects will be assessed individually unless the teacher request for group work.
5	**Cheating**: **-** Cheating by any means will cause the student failure and he/she must re-study the course.
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:**

Course Specification of Community Pharmacy

I. Course Identification and General Information:						
1	**Course Title:**	**Community Pharmacy**				
2	**Course Code & Number:**	**PHA484**				
3	**Credit hours:**	C.H				Total
		Th.	Seminar	practical	Training.	
		2		**1**		**3**
4	**Study level/ semester at which this course is offered:**	Fourth level, second semester				
5	**Pre –requisite (if any):**	Pharmacology (3), Pharmacy regulations and ethics				
6	**Co –requisite (if any):**	none				
7	**Program (s) in which the course is offered:**	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	**Language of teaching the course:**	English Language				
9	**Study System**	Semester				
10	**Mode of delivery:**	Regular				
11	**Location of teaching the course:**	University				
12	**Prepared By:**	**Dr. Hamad Mahmood Alshabi**				

II. Course Description:

The course focuses on giving pharmacy students the knowledge and skills to successfully manage the treatment of patients in the community pharmacy setting. This course introduces students to the concept of non-prescription medications, self-care and the activities of the pharmacist as a health care provider. The course is dealing with a number of common disorders in the pharmacy, diagnosis depending on the symptoms, dosing regimens and how to deal with patients in the pharmacy.

III. Course Objectives:
This course aims to prepare the student to: 1- Provide pharmaceutical care in the community pharmacy, by being able to deal with non-severe medical cases, and design the correct therapeutic management plan, 2- Describe suitable OTC treatment based on the symptoms, causes, and considerations related to the individualized case, and depending on the knowledge with the non-prescription drugs.

IV.	**Course Intended learning outcomes (CILOs) of the course:** Upon successful completion of this course, the student should be able to:	WRITE Symbol and number of PILOs
a.1	Describe the organization and layout of community pharmacy, its importance in healthcare delivery and the roles and responsibilities of community pharmacist.	**A4, A5**
a.2	Describe a number of minor ailments in the pharmacy and their diagnosis depending on the symptoms and the medications (OTC) used to treat them.	**A1, A3**
b.1	Differentiate between symptoms warranting the supervision of a medical doctor and those that can be self-treated.	**B3**
b.2	Design the correct therapeutic management plan for minor diseases that can be treated without referral to doctor.	**B3, B4**
c.1	Provide pharmaceutical care for patient with minor ailments in compliance with legal, ethical and professional guidelines.	**C2, C5**
c.2	Educate and counsel patients about his disease, safe and proper use of medications while dispensing medications (prescribed or recommended).	**C4**
d.1	Apply the proper communication skills needed to deal with patients in the community pharmacy settings during an OTC drug	**D1**

	therapeutic dialogue.	
d.2	Use of internet professional sites to extract information about OTC drugs, symptoms of minor ailments.	**D3**

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	**Teaching strategies**	**Assessment Strategies**
a1- Describe the organization and layout of community pharmacy, its importance in healthcare delivery and the roles and responsibilities of community pharmacist .	- Interactive lectures - Groups discussion. - Case-Study - Assignments	- Written Exams (midterm and final) - Quizzes - Multiple Choice Questions (MCQs) - Assignments & Coursework Activities - Cases Presentation
a2- Describe a number of minor ailments in the pharmacy and their diagnosis depending on the symptoms and the medications (OTC) used to treat them		

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	**Teaching strategies**	**Assessment Strategies**
b1- Differentiate between symptoms warranting the supervision of a medical doctor and those that can be self-treated	- Interactive lectures - Groups discussion. - Problem-solving learning. - Assignments - Simulation - Practical classes (field visit)	- Written Exams (midterm and final) - Quizzes - Multiple Choice Questions (MCQs) - Assignments & Coursework Activities - Problem-solving exercises. - Cases Presentation
b2- Design the correct therapeutic management plan for minor diseases that can be treated without referral to doctor		

(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	**Teaching strategies**	**Assessment Strategies**
c1- Provide pharmaceutical care for patient with minor ailments in compliance with legal, ethical and professional guidelines .	- Practical classes (field visit) - Problem-solving learning. - Case-Study	- Assessments and reports - Problem-solving exercises. - Coursework Activities - Cases Presentation
c2- Educate and counsel patients about his disease, safe and proper use of medications while dispensing medications (prescribed or recommended).		

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	**Teaching strategies**	**Assessment Strategies**
d1- Apply the proper communication skills needed to deal with patients in the community pharmacy settings during an OTC drug therapeutic dialogue	- Practical classes (field visit) - Cooperative & Self – learning. - Assignments	- Oral Presentation - Assignments & Coursework Activities - Reports of Assignments - Cases Presentation
d2- Use of internet professional sites to extract information about OTC drugs, symptoms of minor ailments.		

V. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	contact hours
1	**Introduction**	a1, b1, b2, d1	Introduction to community pharmacy, self-care and non-prescription (OTC) medications, Patient assessment and consultation.	**2**	**4**
2	**CNS related conditions**	a2, b1, b2, c1, c2, d1,	Pain management/Fever Insomnia	**2**	**4**

		d2			
3	**Respiratory problems**	a2, b1, b2, c1, c2, d1, d2	Common cold and flu Cough Sore Throat Allergic rhinitis	**3**	**6**
4		a1, a2, b1, b2, c1-c2, d1	**Mid-term Exam**	**1**	**2**
5	**Gastrointestinal tract problems**	a2, b1, b2, c1, c2, d1, d2	Constipation Diarrhea Heartburn Indigestion Hemorrhoids	**3**	**6**
6	**Women care**	a2, b1, b2, c1, c2, d1, d2	Cystitis Dysmenorrhoea Vaginal discharge	**1**	**2**
7	**Skin conditions**	a2, b1, b2, c1, c2, d1, d2	Acne Athlete's foot Cold sores	**2**	**4**
8	**Childhood problems**	a2, b1, b2, c1, c2, d1, d2	Common Childhood Rashes, Colic Threadworms	**1**	**2**
		a1, a2, b1, b2, c1-c2, d1	**Final Term exam**	**1**	**2**
Number of Weeks /and Units Per Semester				**16**	**32**

B - Practical Aspect: (if any)

Order	Tasks/ Experiments	Number of Weeks	contact hours	Learning Outcomes
1	Introduction and self-care	1	2	a1, d1, d2
2	Pain & fever (OTC drugs & cases)	1	2	a2, b1, b2, c1, c2, d1, d2
3	Pain & fever (OTC drugs & cases)	1	2	a2, b1, b2, c1, c2, d1, d2
4	Common cold (OTC drugs & cases)	1	2	a2, b1, b2, c1, c2, d1, d2
5	Allergic rhinitis & cough (OTC drugs & cases)	1	2	a2, b1, b2, c1, c2, d1, d2
6	Allergic rhinitis & cough (OTC drugs & cases)	1	2	a2, b1, b2, c1, c2, d1, d2
7	Constipation & Diarrhea (OTC drugs & cases)	1	2	a2, b1, b2, c1, c2, d1, d2
8	Heartburn & Indigestion (OTC drugs & cases)	1	2	a2, b1, b2, c1, c2, d1, d2
9	Hemorrhoids (OTC drugs & cases)	1	2	a2, b1, b2, c1, c2, d1, d2
10	Cystitis Dysmenorrhoea Vaginal discharge (OTC drugs & cases)	1	2	a2, b1, b2, c1, c2, d1, d2
11	Cystitis	1	2	a2, b1, b2, c1, c2, d1, d2

	Dysmenorrhoea Vaginal discharge (OTC drugs & cases)			
12	Acne, Athlete's foot Cold sores (OTC drugs & cases)	**1**	**2**	a2, b1, b2, c1, c2, d1, d2
13	Common Childhood Rashes, Colic Threadworms (OTC drugs & cases)	**1**	**2**	a2, b1, b2, c1, c2, d1, d2
14	**Final practical exam**	**1**	**2**	b1, b2, c1, c2, d1
Number of Weeks /and Units Per Semester		**14**	**28**	

VI. Teaching strategies of the course:

- Interactive lectures
- Groups discussion.
- Case-Study
- Assignments
- Problem-solving learning.
- Simulation
- Practical classes (field visit)
- Cooperative & Self – learning.

VII. Assignments:

No	Assignments	Aligned CILOs (symbols)	Week Due	Mark
1	Participation, Homework	**a1-a2, b1-b2, d1-d2**	Weekly	**2**
2	Exercises.	**b1-b2, c1-c2, d1-d2**	Weekly	**3**
	Total Score			**5**

VIII. Schedule of Assessment Tasks for Students During the Semester:					
No.	**Assessment Method**	**Week Due**	**Mark**	**Proportion of Final Assessment**	**Aligned Course Learning Outcomes**
1	Assignments	Weekly	**5**	**5** %	**a1-a2, b1-b2, c1-c2, d1-d2**
2	Quizzes 1	**W6**	2.5	2.5%	**a1-a2, b1**
3	Mid-term exam of theoretical part (written exam)	**W8**	20	20%	a1, a2, b1, b2, c1-c2, d1
4	Quizzes 2	**W12**	2.5	2.5%	a1-a2, b1
	Practical lab work	Weekly	10	10	a2, b1, b2, c1, c2, d1, d2
	Final exam (practical)	**W14**	30	30	b1, b2, c1, c2, d1
5	Final exam of theoretical part (written exam)	**W16**	70	70%	a1, a2, b1, b2, c1-c2, d1
6	**Total**		100	100%	

IX. Learning Resources:	
1- Required Textbook(s) (maximum two).	
	1- Paul Rutter,. (2021). Community Pharmacy: Symptoms, Diagnosis and Treatment. fourth edition. Elsevier Ltd. 2- Krinsky et al. (2015). Handbook of non-prescription drugs – An interactive approach to self-care, 18th edition - American Pharmacists Association (APhA).
2- Essential References.	
	1- Blenkinsopp, A., Paxton, P., and Blenkinsopp, J. (2018). The Symptoms in the pharmacy: a guide to the management of common illness. 8th Edition. John Wiley & Sons.
3- Electronic Materials and Web Sites *etc*.	

	X. Course Policies:
1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** - Assignments and projects will be assessed individually unless the teacher request for group work
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:** -

Template for Course Plan (Syllabus) of Community Pharmacy

I. - Information about Faculty Member Responsible for the Course:								
Name of Faculty Member		**Office Hours**						
Location& Telephone No.		**SAT**	**SUN**	**MON**	**TUE**	**WED**	**THU**
E-mail							

II. Course Identification and General Information:						
1	**Course Title:**	**Community Pharmacy**				
2	**Course Code & Number:**	**PHA484**				
3	**Credit hours:**	C.H				Total
		Th.	Seminar	practical	Training.	
		2		**1**		**3**
4	**Study level/ semester at which this course is offered:**	Fourth level, second semester				
5	**Pre –requisite (if any):**	**Pharmacology (3),** Pharmacy regulations and ethics				
6	**Co –requisite (if any):**	None				
7	**Program (s) in which the course is offered:**	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	**Language of teaching the course:**	English Language				
9	**Study System**	Semester				
10	**Mode of delivery:**	Regular				
11	**Location of teaching the course:**	University				

III. Course Description:

The course focuses on giving pharmacy students the knowledge and skills to successfully manage the treatment of patients in the community pharmacy setting. This course introduces students to the concept of non-prescription medications, self-care and the activities of the pharmacist as a health care provider. The course is dealing with a number of common disorders in the pharmacy, diagnosis depending on the symptoms, dosing regimens and how to deal with patients in the pharmacy.

IV. Course Objectives:

This course aims to prepare the student to:

1- Provide pharmaceutical care in the community pharmacy, by being able to deal with non-severe medical cases, and design the correct therapeutic management plan,

2- Describe suitable OTC treatment based on the symptoms, causes, and considerations related to the individualised case, and depending on the knowledge with the non-prescription drugs.

V. Intended learning outcomes (ILOs) of the course:

Upon successful completion of this course, the student should be able to:

1- Describe the organization and layout of community pharmacy, its importance in healthcare delivery and the roles and responsibilities of community pharmacist .
2- Describe a number of minor ailments in the pharmacy and their diagnosis depending on the symptoms and the medications (OTC) used to treat them .
3- Differentiate between symptoms warranting the supervision of a medical doctor and those that can be self-treated .
4- Design the correct therapeutic management plan for minor diseases that can be treated without referral to doctor .
5- Provide pharmaceutical care for patient with minor ailments in compliance with legal, ethical and professional guidelines .
6- Educate and counsel patients about his disease, safe and proper use of medications while dispensing medications (prescribed or recommended).
7- Apply the proper communication skills needed to deal with patients in the community pharmacy settings during an OTC drug therapeutic dialogue .
8- Use of internet professional sites to extract information about OTC drugs, symptoms of minor ailments.

VI. Course Content:			
A – Theoretical Aspect:			
Order	**Topics List**	**Week Due**	**Contact Hours**
1	**Introduction** to community pharmacy, self-care and non-prescription (OTC) medications, Patient assessment and consultation.	1, 2	4
2	**CNS related conditions:** Pain management/Fever Insomnia	3, 4	4
3	**Respiratory problems:** Common cold and flu Cough Sore Throat Allergic rhinitis	5, 6, 7	6
4	**Mid-term Exam**	8	2
5	**Gastrointestinal tract problems:** Constipation Diarrhea Heartburn Indigestion Hemorrhoids	9, 10, 11	6
6	**Women care:** Cystitis Dysmenorrhoea Vaginal discharge	12	2
7	**Skin conditions** Acne	13, 14	4

	Athlete's foot Cold sores		
8	**Childhood problems:** Common Childhood Rashes, Colic, Threadworms	15	2
9	**Final Term exam**	16	2
Number of Weeks /and Units Per Semester			

B – Practical Aspect: ***(if any)***			
Order	**Topics List**	**Week Due**	**Contact Hours**
1	Introduction and self-care	**1st**	**2**
2	Pain & fever (OTC drugs & cases)	2nd	**2**
3	Pain & fever (OTC drugs & cases)	3rd	**2**
4	Common cold (OTC drugs & cases)	4th	**2**
5	Allergic rhinitis & cough (OTC drugs & cases)	5th	**2**
6	Allergic rhinitis & cough (OTC drugs & cases)	6th	**2**
7	Constipation & Diarrhea (OTC drugs & cases)	7th	**2**
8	Heartburn & Indigestion (OTC drugs & cases)	8th	**2**
9	Hemorrhoids (OTC drugs & cases)	9th	**2**
10	Cystitis Dysmenorrhoea	10th	**2**

	Vaginal discharge (OTC drugs & cases)		
11	Cystitis Dysmenorrhoea Vaginal discharge (OTC drugs & cases)	**11th**	**2**
12	Acne, Athlete's foot Cold sores (OTC drugs & cases)	**12th**	**2**
13	Common Childhood Rashes, Colic Threadworms (OTC drugs & cases)	13th	**2**
14	**Final practical exam**	**14th**	**2**
Number of Weeks /and Units Per Semester			

VII. Teaching strategies of the course:
- Interactive lectures - Groups discussion. - Case-Study - Assignments - Problem-solving learning. - Simulation - Practical classes (field visit) - Cooperative & Self – learning.

VIII. Assignments:

No	**Assignments**	**Week Due**	**Mark**
1	Participation, Homework	Weekly	**2**
2	Exercises.	Weekly	**3**
	Total Score		**5**

IX. Schedule of Assessment Tasks for Students During the Semester:				
Assessment	**Type of Assessment Tasks**	**Week Due**	**Mark**	**Proportion of Final Assessment**
1	Assignments	Weekly	**5**	**5** %
2	Quizzes 1	**W6**	2.5	2.5%
3	Mid-term exam of theoretical part (written exam)	**W8**	20	20%
4	Quizzes 2	**W12**	2.5	2.5%
5	Practical lab work	Weekly	10	10
6	Final exam (practical)	**W14**	30	30
7	Final exam of theoretical part (written exam)	**W16**	70	70%
	Total		100	100%

X. Learning Resources:	
1- Required Textbook(s) (maximum two).	
	1- Paul Rutter,. (2021). Community Pharmacy: Symptoms, Diagnosis and Treatment. fourth edition. Elsevier Ltd. 2- Krinsky et al. (2015). Handbook of non-prescription drugs – An interactive approach to self-care, 18th edition - American Pharmacists Association (APhA).
2- Essential References.	
	1- Blenkinsopp, A., Paxton, P., and Blenkinsopp, J. (2018). The Symptoms in the pharmacy: a guide to the management of common illness. 8th Edition. John Wiley & Sons.
3- Electronic Materials and Web Sites *etc*.	

XI. Course Policies:	
1	**Class Attendance:**

	- At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam.
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** - Assignments and projects will be assessed individually unless the teacher request for group work.
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course.
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:**

Course Specification of Pharmaceutical Management and marketing

I. Course Identification and General Information:

1	**Course Title:**	**Pharmaceutical Management and marketing**				
2	**Course Code & Number:**	**PHA485**				
3	**Credit hours:**	C.H				TOTAL
		Th.	Seminar	Pr	Tr.	
		2	**----**	**----**	**----**	**2**
4	**Study level/ semester at which this course is offered:**	**5 Level / 1 Semester**				
5	**Pre –requisite (if any):**	**Pharmaceutical Legislations & Ethics**				
6	**Co –requisite (if any):**	**None**				
7	**Program (s) in which the course is offered:**	**Bachelor of pharmaceutical Sciences (B. Pharm. Sc)**				
8	**Language of teaching the course:**	**English Language**				
9	**Study System**	**Semester**				
10	**Mode of delivery:**	**Regular**				
11	**Location of teaching the course:**	**University**				
12	**Prepared By:**	**Dr. Mujeeb Al-Nahari**				

II. Course Description:

The course is designed to teach pharmacy students the concepts and principles of management and marketing and their applications in a pharmaceutical context. The management section covers introduction, operations management, people management, managing traditional goods and services and managing value-added services. The marketing section covers introduction, pharmaceutical marketing promotional mix and promotional activities, element of pharmaceutical marketing plan and planning, pharmaceutical marketing analysis, management of product life cycle, finance and accounting – relationship between marketing and finance, managing profitability of business/brand, balance sheet and operating income management & merchandizing and stock management.

III. Course Objectives:

At the end of the course, students should

1- Have a sufficient background about the basics of management and marketing in pharmacy.

2- Be able to apply these essentials in different pharmacy practice settings.

IV. Course Intended learning outcomes (CILOs) of the course		Referenced PILOs
a.1	Understand the manage pharmacy activities from setting up the pharmacy, to distribution of the medical items.	A4
a.2	Describe the principles and concepts of personnel and resources management and pharmaceutical marketing in business.	A5
b.1	Analyze the components required to develop a pharmacy business plan.	B4
b.2	Integrate the personnel and resources management skills and other tools for supporting effective management of pharmacy.	B4
c.1	Assess Marketing plan and planning.	C3
c.2	Comply with the ethics, laws, regulations and standards of the pharmacy profession.	C5
d.1	Effectively communicate verbally and non-verbally with patients, personnel and other healthcare professionals.	D1

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1- Understand the manage pharmacy activities from setting up the pharmacy, to distribution of the medical items	- Lectures - Seminars - Discussion	- Quizzes - Written Exam - Assignment
a2- Describe the principles and concepts of personnel and resources management.		

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1- Analyze the components required to develop a pharmacy business plan.	- Lectures - Seminars - Discussion	- Quizzes - Written Exam - Assignment
b2- Integrate the personnel and		

resources management skills and other tools for supporting effective management of pharmacy.		

© Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1- Assess Marketing plan and planning.	- Lectures - Seminars - Discussion	- Quizzes - Written Exam - Assignment
c2- Comply with the ethics, laws, regulations and standards of the pharmacy profession.		

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1- Effectively communicate verbally and non-verbally with patients, personnel and other healthcare professionals.	- Seminars - Discussion	- Presentation - Assignment

V. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	contact hours
1	**Introduction**	a 1, a2	- The "Management" in Medication Therapy Management - Management Functions - Leadership in Pharmacy Practice - Ethical Decision-Making, Problem-Solving, and Delegating Authority - Creating and	1	2

			Managing Value		
2	**Operations Management**	a 1, a2, b1, b2, c1, d1	- Strategic Planning in Pharmacy Operations - Business Planning for Pharmacy Programs - Operations Management - Managing Technology That Supports the Medication Use Process - Ensuring Quality in Pharmacy Operations - Risk Management in Contemporary Pharmacy Practice - Preventing and Managing Medication Errors: the Pharmacist's Role - Compliance With Regulations and Regulatory Bodies	1	2
3	**People Management**	a 1, a2, b1, b2, d1, d2	- Managing Yourself for Success - Negotiation Skills - Organizational Structure and Behavior	1	2
4	**People Management**	a 1, a2, b1, b2,c1, d1	- Human Resources Management Functions - The Basics of Employment Law and Workplace Safety - Pharmacy Technicians - Performance Appraisal Systems	1	2
5	**Managing Traditional Goods**		- Marketing Fundamentals	1	2

	and Services	a 1, a2, b1, b2, c1,d1	- Marketing Applications - Customer Service - Supply Chain Management - Merchandising		
6	**Managing Value-Added Services**	a 1, a2, b1, b2, c1,d1	- Value-Added Services as a Component of Enhancing Pharmacists' Roles in Public Health - Implementing Value-Added Pharmacist Services	1	2
7	**Midterm Exam**	a 1, a2, b1, b2, c1,c2, d1	-	1	2
8	**Introduction to pharmaceutical marketing**	a 1, a2, b1, b2,c1 ,d1	- Methods of Economic Evaluation - The professional sales person	1	2
9	**pharmaceutical Marketing promotional mix and promotional activities**	a 1, a2, b1, b2,c1, d1	- Communication	1	2
10	**Element of pharmaceutical marketing plan and planning**	a 1, a2, b1, b2, c1,c2,d1	- Marketing Plain and Marketing Mix	1	2
11	**pharmaceutical Marketing analysis**	a 1, a2, b1, b2, c1,c2,d1	- Selling	1	2
12	**Management of product life cycle**	a 1, a2, b1, b2, c1,c2,d1	- Definitions, classifications	1	2

13	**Finance and accounting – relationship between marketing and finance**	a 1, a2, b1, b2, c1,c2,d1	- Electronic Information Management	1	2
14	**Managing profitability of business/brand**	a 1, a2, b1, b2, c1,c2,d1	- Definitions, classifications	1	2
15	**Balance sheet and operating income management& Merchandizing and stock management**	a 1, a2, b1, b2, c1,c2,d1	- Definitions, classifications	1	2
16	**Final Exam**	a 1, a2, b1, b2, c1,c2,d1		1	2
Number of Weeks /and Units Per Semester				**16**	**32**

VI. Teaching strategies of the course:

- Lectures
- Seminars
- Discussion

VII. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	**Each student presents seminar on selected topic of course**	a 1, a2, b1, b2, c1, d1, d2	11th	5

VIII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Assignments	11th	5	5%	a1, a2, b1, b2, c1, d1
2	Quizzes	10th	5	5%	a 1, a2, b1, b2, c1, d1
3	Mid-Term Theoretical Exam	7th	20	20%	a 1, a2, b1, b2, c1, d1
4	Final Theoretical Exam	16th	70	70%	a 1, a2, b1, b2, c1, d1
Total			100	100%	

IX. Learning Resources:

1- Required Textbook(s) (maximum two).

1- MD Karch, Drummer Steven B., Olaf, 2014. Leadership and Management in Pharmacy Practice, 2nd Edition, https://doi.org/10.1201/b17919
2- Mickey C. Smith., 1991, Pharmaceutical Marketing: Strategy and cases. Haworth Press Inc.
3- Loyd, V Allen J, 2013, Remington: The Science and Practice of Pharmacy 22nd Edition, Pharmaceutical Press, London.

2- Essential References.

1-hane P. Desselle, David P. Zgarrick, Greg L. Alston, 2020. Parmacy Management: Essentials for All Practice Setting. 3rd Edition; ISBN: 978-0-07-177431-4
2-Dennis Tootelian , 2012. Essentials of Pharmacy Management, 2nd Edition

3- Electronic Materials and Web Sites *etc*.

1-https://www.ashp.org/Pharmacy-Practice/Policy-Positions-and-Guidelines/Browse-by-Topic/Pharmacy-Management?loginreturnUrl=SSOCheckOnly
2- https://www.fip.org

X. Course Policies:

1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2	**Tardy:** - Any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.

3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects**: - Assignments and projects will be assessed individually unless the teacher request for group work
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the faculty rules.
7	**Other policies**:

Course Plan (Syllabus) of Pharmaceutical Management and marketing

I. Information about Faculty Member Responsible for the Course:

		Office Hours					
Name of Faculty Member							
Location& Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

II. Course Identification and General Information:

1-	Course Title:	Pharmaceutical Management and marketing				
2-	Course Number & Code:	PHA485				
3-	Credit hours:	C.H				Total
		Th.	Seminar	Pr.	F. Tr.	
		2	----	----	----	2
4-	Study level/year at which this course is offered:	5 Level / 1 Semester				
5-	Pre –requisite (if any):	Pharmaceutical Legislations & Ethics				
6-	Co –requisite (if any):	None				
7-	Program (s) in which the course is offered	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8-	Language of teaching the course:	English Language				
9-	System of Study:	Semester				
10-	Mode of delivery:	Regular				
11-	Location of teaching the course:	University				
12-	Prepared By:	Dr. Mujeeb Al-Nahari				

III. Course Description:

The course is designed to teach pharmacy students the concepts and principles of management and marketing and their applications in a pharmaceutical context. The management section covers introduction, operations management, people management, managing traditional goods and services and managing value-added services. The marketing section covers introduction, pharmaceutical marketing promotional mix and promotional activities, element of pharmaceutical marketing plan and planning, pharmaceutical marketing analysis, management of product life cycle, finance and accounting – relationship between marketing and finance, managing profitability of business/brand, balance sheet and operating income management & merchandizing and stock

management.

IV. Course Objectives:

At the end of the course, students should

1- Have a sufficient background about the basics of management and marketing in pharmacy.

2- Be able to apply these essentials in different pharmacy practice settings.

V. Intended learning outcomes (ILOs) of the course:

Brief summary of the knowledge or skill the course is intended to develop:
Understand the manage pharmacy activities from setting up the pharmacy, to distribution of the medical items.
Describe the principles and concepts of personnel and resources management and pharmaceutical marketing in business.
Analyze the components required to develop a pharmacy business plan.
Integrate the personnel and resources management skills and other tools for supporting effective management of pharmacy.
Assess Marketing plan and planning.
Comply with the ethics, laws, regulations and standards of the pharmacy profession.
Effectively communicate verbally and non-verbally with patients, personnel and other healthcare professionals.

VI. Course Content:

A – Theoretical Aspect:

Order	Topics List	Week Due	Contact Hours
1	**Introduction:** - The "Management" in Medication Therapy Management - Management Functions - Leadership in Pharmacy Practice - Ethical Decision-Making, Problem-Solving, and Delegating Authority - Creating and Managing Value	1	2

2	**Operations Management:** - Strategic Planning in Pharmacy Operations - Business Planning for Pharmacy Programs - Operations Management - Managing Technology That Supports the Medication Use Process - Ensuring Quality in Pharmacy Operations - Risk Management in Contemporary Pharmacy Practice - Preventing and Managing Medication Errors: the Pharmacist's Role - Compliance With Regulations and Regulatory Bodies	2	2
3	**People Management:** - Managing Yourself for Success - Negotiation Skills - Organizational Structure and Behavior	3	2
4	**People Management:** - Human Resources Management Functions - The Basics of Employment Law and Workplace Safety - Pharmacy Technicians - Performance Appraisal Systems	4	2
5	**Managing Traditional Goods and Services:** - Marketing Fundamentals - Marketing Applications - Customer Service - Supply Chain Management - Merchandising	5	2
6	**Managing Value-Added Services:** - Value-Added Services as a Component of Enhancing Pharmacists' Roles in Public Health - Implementing Value-Added Pharmacist Services	6	2
7	**Midterm Exam**	7	2
8	**Introduction to pharmaceutical marketing:** - Methods of Economic Evaluation The professional sales person	8	2
9	**Pharmaceutical Marketing promotional mix and promotional activities:** - Communication	9	2
10	**Element of pharmaceutical marketing plan and planning:** - Marketing Plain and Marketing Mix	10	2
11	**Pharmaceutical Marketing analysis:** - Selling	11	2

12	**Management of product life cycle:** - Definitions, classifications	12	2
13	**Finance and accounting – relationship between marketing and finance:** - Electronic Information Management	13	2
14	**Managing profitability of business/brand:** - Definitions, classifications	14	2
15	**Balance sheet and operating income management& Merchandizing and stock management:** - Definitions, classifications	15	2
16	**Final Exam**	16	2
Number of Weeks /and Units Per Semester		**16**	**32**

VII. Teaching strategies of the course:

Lectures
Seminars
Discussion

VIII. Assignments:

No	Assignments	Week Due	Mark
1	Each student presents seminar on selected topic of course.	11th	5
2			

IX. Schedule of Assessment Tasks for Students During the Semester:

Assessment	Type of Assessment Tasks	Week Due	Mark	Proportion of Final Assessment
1	Assignments	11th	5	5%
2	Quizzes	10th	5	5%
3	Mid-Term Theoretical Exam	7th	20	20%
4	Final Theoretical Exam	16th	70	60%
5	Total		100	100%

X. Learning Resources:

1- Required Textbook(s) (maximum two).

1- MD Karch, Drummer Steven B., Olaf, 2014. Leadership and Management in Pharmacy Practice, 2nd Edition, https://doi.org/10.1201/b17919
2- Loyd, V Allen J, 2013, Remington: The Science and Practice of Pharmacy 22nd Edition, Pharmaceutical Press, London.

2- Essential References.

1-hane P. Desselle, David P. Zgarrick, Greg L. Alston, 2020. Parmacy Management: Essentials for All Practice Setting. 3rd Edition; ISBN: 978-0-07-177431-4
2-Dennis Tootelian , 2012. Essentials of Pharmacy Management, 2nd Edition.

3- Electronic Materials and Web Sites *etc*.

1- https://www.ashp.org/Pharmacy-Practice/Policy-Positions-and-Guidelines/Browse-by-Topic/Pharmacy-Management?loginreturnUrl=SSOCheckOnly
2- https://www.fip.org

XI. Course Policies:

1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** - Assignments and projects will be assessed individually unless the teacher request for group work
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:** -

Course Specification of Therapeutics (1)

I. Course Identification and General Information:

1	**Course Title:**	**Therapeutics (1)**				
2	**Course Code & Number:**	**PHA486**				
3	**Credit hours:**	C.H				Total
		Th.	Seminar	Pr	Tr.	
		2	----	1	----	*3*
4	**Study level/ semester at which this course is offered:**	**4th Level / 2nd Semester**				
5	**Pre –requisite (if any):**	Pharmacology (3), Pharmaceutical Care				
6	**Co –requisite (if any):**	**None**				
7	**Program (s) in which the course is offered:**	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	**Language of teaching the course:**	English Language				
9	**Study System**	Semester				
10	**Mode of delivery:**	Regular				
11	**Location of teaching the course:**	University				
12	**Prepared By:**	**Dr. Mujeeb Al-Nahari**				

II. Course Description:

This course focuses on giving Pharmacy students the knowledge and skills to successfully manage the treatment of patients in the clinical Pharmacy setting. It covers the roles of clinical pharmacist, drug related problems, patient case presentation; and the pathophysiology, clinical manifestations, diagnosis, complications, goals of therapy, treatment options, patient education, drug monitoring and evaluation of the therapeutic outcomes of selected cardiovascular and endocrinologic disorders. It also focuses on methods of delivering patient care that will facilitate improving health outcomes through effective communication. The course also includes practical part that involves simulated case studies and visiting to hospital.

III. Course Objectives:

This course aims to:

1- Prepare the student to gain knowledge in therapeutics.

2- Prepare the student to develop skills in medicine and disease information seeking, problem solving and provision of medicine and disease information to patients.

3- Produce graduates who are able to apply knowledge in a proactive manner to achieve optimal medication management.

IV.	Course Intended learning outcomes (CILOs) of the course	Referenced PILOs
a.1	Demonstrate the etiology, pathophysiology, physical examination, diagnosis, and prognosis of cardiovascular and endocrine disorders.	A1
a.2	Outline the goals of therapy for patients with cardiovascular and endocrine disorders.	A1, A3
a.3	Identify the role of pharmacist in the pharmaceutical care plan of cardiovascular and endocrine disorders.	A4
b.1	Design and evaluate patient care plan for selected cardiovascular and endocrinologic disorders	B3
c.1	Use properly drugs regimen and monitoring parameters to achieve targeted therapeutic outcomes of cardiovascular and endocrine disorders.	C2
c.2	Provide an evidence-based information to the health care team regarding the rational drug selections.	C4
d.1	Search efficiently for required medical information in professional medical references and sites.	D3
d.2	Interact effectively and ethically with a healthcare team and patients.	D1

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1- Demonstrate the etiology, pathophysiology, phys/ical examination, diagnosis, and prognosis of cardiovascular and endocrine disorders.	Lectures Discussion Case study Seminar	Written exam, Quizzes Assignment
a2- Outline the goals of therapy for patients with cardiovascular and endocrine disorders.		
a3-Identify the role of pharmacist in the pharmaceutical care plan of cardiovascular and endocrine disorders.		

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1- Design and evaluate patient care plan for selected cardiovascular and endocrinologic disorders	Lectures, Discussion, case study, Problem-Solving learning, Field visit	Written exam Assignment, case study Problem-Solving Exercises.

© Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
C1- Use properly drugs regimen and monitoring parameters to achieve targeted therapeutic outcomes of cardiovascular and endocrine disorders .	Discussion, Practical classes Case study, Problem-Solving learning, Field visit	Practical exam Assignment, case study Problem-Solving Exercises. Reports
C2- Provide an evidence based information to the health care team regarding the rational drug selections.		

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1- Search efficiently for required medical	Discussion	Presentation

information in professional medical references and sites.	Cooperative Learning Practical classes Self-learning Seminar	Observation Assignment and Reports
d2- Interact effectively and ethically with a healthcare team and patients.		

V. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	contact hours
1-	**Introduction to clinical pharmacy**	a3, b1, c1, c2, d1, d2	Roles of clinical pharmacist	1	2
			Drug Related Problems	1	2
			Patient Case Presentation	1	2
2-	**CV disorders**	a1, a2, a3, b1, c1, c2, d1, d2	Hypertension	1	2
			Heart failure	1	2
			Dyslipidemia	1	2
3-	**Midterm Exam**	a1, a2, a3, b1, c1, c2, d1, d2		1	2
4-	**CV disorders**	a1, a2, a3, b1, c1,c2, d1,d2	Stable coronary heart disease	1	2
5-			Acute coronary syndrome	1	2
6-			Atrial fibrillation	1	2
7-	**Endocrine disorders**	a1, a2, a3, b1, c1, c2, d1, d2	Diabetes Mellitus 1	1	2
			Diabetes Mellitus 2	1	2
			Hyperthyroidism	1	2
			Hypothyroidism	1	2
8-	**Revision**	a1, a2, a3, b1, c1, c2, d1, d2		1	2
9-	**Final Exam**	a1, a2, a3, b1, c1, c2, d1, d2		1	2

Number of Weeks /and Units Per Semester			16	32
B - Practical Aspect:				
Order	**Tasks/ Experiments**	**Number of Weeks**	**contact hours**	**Learning Outcomes**
1	SOAP notes	**1**	**2**	a1, a2, a3, b1, c1,c2, d1,d2
2	Cases on Hypertension	**1**	**2**	a1, a2, a3, b1, c1,c2, d1,d2
3	Cases on heart failure	**1**	**2**	a1, a2, a3, b1, c1,c2, d1,d2
4	Cases on Dyslipidemia	**1**	**2**	a1, a2, a3, b1, c1,c2, d1,d2
5	Cases on Stable Angina	**1**	**2**	a1, a2, a3, b1, c1,c2, d1,d2
6	Cases on Acute coronary syndrome	**1**	**2**	a1, a2, a3, b1, c1,c2, d1,d2
7	Cases on Atrial fibrillation	**1**	**2**	a1, a2, a3, b1, c1,c2, d1,d2
8	Mid-Term Exam	**1**	**2**	a1, a2, a3, b1, c1,c2, d1,d2
9	Cases on DM**1**	**1**	**2**	a1, a2, a3, b1, c1,c2, d1,d2
10	Cases on DM2	**1**	**2**	a1, a2, a3, b1, c1,c2, d1,d2
11	Cases on Hyperthyroidism	**1**	**2**	a1, a2, a3, b1, c1,c2, d1,d2
12	Cases on Hypothyroidism	**1**	**2**	a1, a2, a3, b1, c1,c2, d1,d2
13	Revision	**1**	**2**	a1, a2, a3, b1, c1,c2, d1,d2
14	Final Practical Exam	**1**	**2**	a1, a2, a3, b1, c1,c2, d1,d2
Number of Weeks /and Units Per Semester		**14**	**28**	

VI. Teaching strategies of the course:
Lectures, Discussion Case study Seminar Problem-Solving learning

Field visit Practical classes Cooperative Learning Self-learning

VII. Assignments:				
No	**Assignments**	**Aligned CILOs(symbols)**	**Week Due**	**Mark**
1	**Case presentation**	a1, a2, a3, b1, c1, c2, d1, d2	6th and 9th	5
2				

VIII. Schedule of Assessment Tasks for Students During the Semester:					
No.	**Assessment Method**	**Week Due**	**Mark**	**Proportion of Final Assessment**	**Aligned Course Learning Outcomes**
1	Assignments	6th and 9th	**5**	5%	a1, a2, b1, c1, c2, d1
2	Participation and Quizzes	All Weeks	**5**	5%	a1, a2, b1, c1, c2, d1
3	Mid-Term Exam (Theory)	**7th**	**10**	10%	a1, a2, b1, c1, c2, d1
4	Reports for cases (Practical)	All Weeks	**10**	10%	a1, a2, b1, c1, c2, d1
5	Final Exam (Practical)	**14th**	**30**	30%	a1, a2, b1, c1, c2, d1
6	Final Exam (Theory)	**16th**	**40**	40%	a1, a2, b1, c1, c2, d1
Total			100	100%	

IX. Learning Resources:

1- Required Textbook(s) (maximum two).

1- Chisholm-Burns, M. A., Wells, B. G., & Schwinghammer, T. L. (2019). Pharmacotherapy principles and practice, 5th edition. New York : McGraw-Hill.
2- Walker & Whittlesea, 2018.Clinical Pharmacy and Therapeutics. 6th edition,

Whittlesea, C., & Hodson, K. (2018). Clinical pharmacy and therapeutics, 6th edition. Oxford: Elsevier Health Sciences.

2- Essential References.

1- DiPiro, J. T., Talbert, R. L., Yee, G. C., Matzke, G. R., Wells, B. G., & Posey, L. (2020). Pharmacotherapy A Pathophysiologic Approach, 11th edition. Pharmacotherapy: A Pathophysiologic Approach. New York: McGraw-Hill Education.

2- Zeind, C. S., & Carvalho, M. G. (2018). Applied therapeutics: the clinical use of drugs, 11th edition. Philadelphia: Wolters Kluwer.

3- Electronic Materials and Web Sites *etc.*

1 - www.accesspharmacy.com

2 -Disease management guidelines (specified in lecture notes)

X. Course Policies:

1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2	**Tardy:** - Any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** - Assignments and projects will be assessed individually unless the teacher request for group work
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:**

Template for Course Plan (Syllabus) of Therapeutics (1)

I. Information about Faculty Member Responsible for the Course:

Name of Faculty Member		**Office Hours**					
Location& Telephone No.		**SAT**	**SUN**	**MON**	**TUE**	**WED**	**THU**
E-mail							

II. Course Identification and General Information:

1	**Course Title:**	**Therapeutics (1)**				
2	**Course Number & Code:**	**PHA486**				
3	**Credit hours:**	**C.H**				**Total**
		Th.	**Seminar**	**Pr.**	**F. Tr.**	
		2	----	1	-----	**3**
4	**Study level/year at which this course is offered:**	4 Level / 1 Semester				
5	**Pre –requisite (if any):**	Pharmacology (3), Pharmaceutical Care				
6	**Co –requisite (if any):**	None				
7	**Program (s) in which the course is offered**	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	**Language of teaching the course:**	English Language				
9	**System of Study:**	Semester				
10	**Mode of delivery:**	Regular				
11	**Location of teaching the course:**	University				
12	**Prepared By:**	**Dr. Mujeeb Al-Nahari**				

III. Course Description:

This course focuses on giving Pharmacy students the knowledge and skills to successfully manage the treatment of patients in the clinical Pharmacy setting. It covers the roles of clinical pharmacist, drug related problems, patient case presentation; and the pathophysiology, clinical manifestations, diagnosis, complications, goals of therapy, treatment options, patient education, drug monitoring and evaluation of the therapeutic outcomes of selected cardiovascular and endocrinologic disorders. It also focuses on methods of delivering patient care that will facilitate improving health outcomes through effective communication. The course also includes practical part that involves simulated case studies and visiting to hospital.

IV. Course Objectives:

This course aims to:
1- Prepare the student to gain knowledge in therapeutics.
2- Prepare the student to develop skills in medicine and disease information seeking, problem solving and provision of medicine and disease information to patients.
3- Produce graduates who are able to apply knowledge in a proactive manner to achieve optimal medication management.

V. Intended learning outcomes (ILOs) of the course:

1- Demonstrate the etiology, pathophysiology, physical examination, diagnosis, and prognosis of cardiovascular and endocrine disorders.

2- Outline the goals of therapy for patients with cardiovascular and endocrine disorders.

3- Identify the role of pharmacist in the pharmaceutical care plan of cardiovascular and endocrine disorders.

4- Design and evaluate patient care plan for selected cardiovascular and endocrinologic disorders.

5- Use properly drugs regimen and monitoring parameters to achieve targeted therapeutic outcomes of cardiovascular and endocrine disorders.

6- Provide an evidence based information to the health care team regarding the rational drug selections.

7- Search efficiently for required medical information in professional medical references and sites.

8- Interact effectively and ethically with a healthcare team and patients.

VI. Course Content:

A – Theoretical Aspect:

Order	Topics List	Week Due	Contact Hours
1	**Introduction to clinical pharmacy:** - Roles of clinical pharmacist - Drug Related Problems. - Patient Case Presentation.	1, 2, 3	6
2	**CV disorders:** - Hypertension - Heart failure - Dyslipidemia	4, 5, 6	6
3	**Midterm Exam**	7	2
4	**CV disorders:** - Stable coronary heart disease - Acute coronary syndrome - Atrial fibrillation	8, 9, 10	6
5	**Endocrine disorders:** - Diabetes Mellitus 1 - Diabetes Mellitus 2 - Hyperthyroidism - Hypothyroidism	11, 12, 13, 14	8
6	**Revision**	15	2
7	**Final Exam**	16	2
Number of Weeks /and Units Per Semester		**16**	**32**

B – Practical Aspect:

Order	Topics List	Week Due	Contact Hours
1	SOAP notes	1	2
2	Cases on Hypertension	2	2
3	Cases on heart failure	3	2
4	Cases on Dyslipidemia	4	2
5	Cases on Stable Angina	5	2
6	Cases on Acute coronary syndrome	6	2
7	Cases on Atrial fibrillation	7	2
8	Mid-Term Exam	8	2
9	Cases on DM1	9	2
10	Cases on DM2	10	2
11	Cases on Hyperthyroidism	11	2
12	Cases on Hypothyroidism	12	2
13	Revision	13	2
14	Final Practical Exam	14	2
Number of Weeks /and Units Per Semester		**14**	**28**

VII. Teaching strategies of the course:

Lectures,
Discussion
Case study
Seminar
Problem-Solving learning
Field visit
Practical classes
Cooperative Learning
Self-learning

VIII. Assignments:			
No	**Assignments**	**Week Due**	**Mark**
1	**Case presentation**	6th and 9th	5
2			

IX. Schedule of Assessment Tasks for Students During the Semester:				
Assessment	**Type of Assessment Tasks**	**Week Due**	**Mark**	**Proportion of Final Assessment**
1	Assignments	6th and 9th	**5**	5%
2	Participation and Quizzes	All Weeks	**5**	5%
3	Mid-Term Exam (Theory)	**7th**	**10**	10%
4	Reports for cases (Practical)	All Weeks	**10**	10%
5	Final Exam (Practical)	**14th**	**30**	30%
6	Final Exam (Theory)	**16th**	**40**	40%
7	**Total**		**100**	100%

X. Learning Resources:

1- Required Textbook(s) (maximum two).

1- Chisholm-Burns, M. A., Wells, B. G., & Schwinghammer, T. L. (2019). Pharmacotherapy principles and practice, 5th edition. New York : McGraw-Hill.

2- Walker & Whittlesea, 2018.Clinical Pharmacy and Therapeutics. 6th edition,

Whittlesea, C., & Hodson, K. (2018). Clinical pharmacy and therapeutics, 6th edition. Oxford: Elsevier Health Sciences.

2- Essential References.

1- DiPiro, J. T., Talbert, R. L., Yee, G. C., Matzke, G. R., Wells, B. G., & Posey, L. (2020). Pharmacotherapy A Pathophysiologic Approach, 11th edition. Pharmacotherapy: A Pathophysiologic Approach. New York: McGraw-Hill Education.

2- Zeind, C. S., & Carvalho, M. G. (2018). Applied therapeutics: the clinical use of drugs, 11th edition. Philadelphia: Wolters Kluwer.
3- Electronic Materials and Web Sites *etc*.
1 - www.accesspharmacy.com 2 - Disease management guidelines (specified in lecture notes)

XI.	**Course Policies:**
1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2	**Tardy:** - Any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** - Assignments and projects will be assessed individually unless the teacher request for group work
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:**

Summer training

Course Specification of Pharmaceutical Field Training (1)

I. General Information:

1.	**Course Title:**	Pharmaceutical Field Training (1)				
2.	**Course Code:**	PHA591				
3.	**Course Type:**	Program requirements				
4.	**Credit Hours:**	**Credit Hours**	**Theory Contact Hours**		**Practical Contact Hours**	
			Lecture	**Tutorial/ Seminar**	**Lab**	**Field training**
		7	--	--	--	280
5.	**Level/ Semester at which this Course is offered:**	Summer training after fourth year				
6.	**Pre –Requisite (if any):**	Community Pharmacy				
7.	**Co –Requisite (if any):**	------				
8.	**Program (s) in which the Course is Offered:**	Bachelor of pharmaceutical Sciences				
9.	**Language of Teaching the Course:**					
10.	**Location of Teaching the Course:**	Community pharmacy settings				
11.	**Prepared by:**	Dr. ----				
12.	**Date and Number of Approval by Council:**					

II. Course Description:

This course is the first of a series of three courses designed to provide students with a variety of practice-based opportunities that apply the knowledge and skills gained during their study. The opportunities will occur in select community-based pharmacy practice and structured around a number of formalized activities.

III. Course Description:

III. Course Intended Learning Outcomes (CILOs): Upon successful completion of the course, students will be able to:		**Referenced PILOs**	
A. Knowledge and Understanding:			
a1	Demonstrate knowledge of commonly used medications (prescription and non-prescription), formulations, and drug products available in Yemeni market.	**A3**	Explain competently the pharmacological effects, therapeutic efficacy and safety of pharmaceutical and related products.
a2	Describe the pharmacy operations, drug distribution system and legal, professional and regulatory requirement in the community pharmacy settings.	**A4**	Describe accurately the roles of pharmacist as a: provider of pharmaceutical care, manager of medication use systems and promoter of the public healthcare and wellness.
		A5	Demonstrates sound knowledge and understanding of the concepts and principles related to social/behavioral and administrative sciences to optimize the therapeutic outcomes of medication use.
B. Intellectual Skills:			
b1	Correlate the patient and drug information to identify the medication-related problems and health related needs and recommend the appropriate pharmaceutical plan under the preceptor 's supervision.	**B3**	Practice thinking skills in designing pharmaceutical plans to optimize medication use and reduce the possibility of medication errors, and in solving problems related to pharmaceutical preparations and other related sciences.
		B4	Integrate knowledge of pharmaceutical sciences with social, behavioral, administrative; and clinical sciences to enhance the healthcare systems including

			pharmaceutical industries.
C. Professional and Practical Skills:			
c1	Accurately process the prescription orders according to professional standards and legal guidelines, under the preceptor 's supervision.	**C2**	Provide pharmaceutical care, where appropriate, within the pharmacist scope of practice and expertise and in accordance with GPP and GCP, where applicable.
		C5	Comply with the ethics, laws, regulations and standards of the pharmacy profession.
c2	Participate in inventory management and purchasing including ordering, receiving, storing, and returning products.	**C3**	Employ efficiently the management and technical skills and human, financial and physical resources to manage medication use and distribution systems.
c3	Counsel the patients, their families and community about the appropriate use of medications, devices, self-care, preventive care under the preceptor 's supervision.	**C4**	Provide counselling and advise to patients, their families, community and other health care professionals about safe and rational use of medicines and medical devices, self-care and health promotion and disease prevention.
D. Transferable Skills:			
d1	Demonstrate time management, team work, communication, life-long learning skills and professionalism.	**D1**	Demonstrate good ability at effective management and leadership, critical thinking, problem solving, communication skills, use of modern technology, and collaboration with others.
		D2	Develop his/her scientific and professional capabilities, especially in the field of pharmaceutical practice, and continues his/her graduate studies and continuous learning to enhance professional competence.

d2	Utilize the appropriate information resources to provide accurate and credible information about health and drugs.	**D3**	Assess the requirements of research and resources of Information related to drug discovery, development of pharmaceutical products and pharmaceutical-care practice**.**

IV. Alignment of Course Intended Learning Outcomes

(A) Alignment of Course Intended Learning Outcomes (Knowledge and Understanding) to Teaching Strategies and Assessment Methods:

	Course Intended Learning Outcomes	Teaching Strategies	Assessment Strategies
a1	Demonstrate knowledge of commonly used medications (prescription and non-prescription), formulations, and drug products available in Yemeni market.	- Case-Study - Self-Learning - Projects - Discussion - Field-training	- Oral Exams - Oral Presentation & Seminar Assessment -Assignments & Coursework Activities -Reports of Assignments -Cases Presentation
a2	Describe the pharmacy operations, drug distribution system and legal, professional and regulatory requirement in the community pharmacy settings.		

(B) Alignment of Course Intended Learning Outcomes (Intellectual Skills) to Teaching Strategies and Assessment Methods:

Course Intended Learning Outcomes	Teaching Strategies	Assessment Strategies

b1	Correlate the patient and drug information to identify the medication-related problems and health related needs and recommend the appropriate pharmaceutical plan under the preceptor 's supervision.	- Feedback learning - Case-Study - Feedback learning - Projects - Discussion - Problem-based Learning - Field-training - Simulation - Cooperative learning	- Oral Presentation & Seminar Assessment - Assignments and reports - observation - Problem Solving Exercise - Cases Presentation

(C) Alignment of Course Intended Learning Outcomes (Professional and Practical Skills) to Teaching Strategies and Assessment Methods:

	Course Intended Learning Outcomes	Teaching Strategies	Assessment Strategies
c1	Accurately process the prescription orders according to professional standards and legal guidelines, under the preceptor 's supervision.	- Feedback learning - Case-Study - Feedback learning - Projects - Problem-based Learning - Field-training - Simulation - Cooperative learning	- Assignments & Coursework Activities - Problem Solving Exercise - Cases Presentation - Work samples, such as, Pharmacy Practice Manual, Logbooks and Portfolios - Multi-source assessments, such as Student Self-Assessment
c2	Participate in inventory management and purchasing including ordering, receiving, storing, and returning products.		
c3	Counsel the patients, their families and community about the appropriate use of medications, devices, self-care, preventive care under the preceptor 's supervision.		

(D) Alignment of Course Intended Learning Outcomes (Transferable Skills) to Teaching Strategies and Assessment Methods:

Course Intended Learning Outcomes		Teaching Strategies	Assessment Strategies
d1	- Demonstrate time management, team work, communication, life-long learning skills and professionalism.	- Feedback learning - Case-Study - Feedback learning - Projects - Discussion - Problem-based Learning - Field-training - Simulation - Computer aided learning - Cooperative learning -	- Oral Presentation & Seminar Assessment - Assignments & Coursework Activities - Problem Solving Exercise - Cases Presentation - Work samples, such as, Pharmacy Practice Manual, Logbooks and Portfolios
d2	- Utilize the appropriate information resources to provide accurate and credible information about health and drugs.		

V. Course Contents:

Practical Aspect (field training):

No.	Tasks/ Experiments	Number of Weeks	Contact Hours (36 hrs./week)	Learning Outcomes (CILOs)
1.	**Orientation** 1. Organizational structure 2.Roles and responsibilities of pharmacist 3. Community pharmacy services	0.5	18	a2
2.	**Arrangement of medications according to** a. their alphabetical order b. their uses c. their dosage forms	0.5	18	a1, a2, c2, d1.
3.	**Medication information (Top prescribed and top OTC drugs:** Brand and generic names, therapeutic class, pharmacologic class, mechanism of action,	1	36	a1, b.1, c3, d1-d2

No.	Tasks/ Experiments	Number of Weeks	Contact Hours (36 hrs./week)	Learning Outcomes (CILOs)
	dosage forms available, route of administration, indications, dosing, side effects, contraindications precautions, interactions and patient's counseling.			
4.	**Prescription processing** (under supervision) 1.Validate the prescription 2.Reading and checking patient's information 3. Reading and checking information related to drugs in the prescription 4. Identification of medication errors 5. Filling the prescription 6. Labeling the drugs to be dispensed a. Writing the name, age and sex of patient b. Writing directions for use	**1**	**36**	**a1- a2, b.1, c1, c3, d1-d2**
5.	1-Dispensing medications under supervision 2- Patients counseling under supervision	**2**	**72**	**a1- a2, b.1, c1, c3, d1-d2**
6.	- Responding to minor ailments: under supervision - Gastrointestinal tract: heartburn, indigestion, diarrhea, constipation, hemorrhoids, nausea and vomiting - Respiratory system: Cough, cold, sore throat, rhinitis - CNS: Pain, fever, headache. - Skin conditions: cold sores, dandruff, fungal infections, eczema/dermatitis, acne, …… - Women's health: cystitis, dysmenorrhea, vaginal thrush, …. - Childhood conditions: head lice, threadworm, colic, nappy rash, ..	**2**	**72**	**a1- a2, b.1, c1, c3, d1-d2**

No.	Tasks/ Experiments	Number of Weeks	Contact Hours (36 hrs./week)	Learning Outcomes (CILOs)
7.	**Inventory control:** - Procedure for ordering and purchasing - Return to wholesaler/stock and return from patients - Outdated drugs - Storage conditions of drugs - Giving special importance to controlled & emergency drugs; their storage conditions and inventory control	1	36	a2, c3, d1
Number of Weeks /and Units Per Semester		8	280	

VI. Assignments:

No.	Assignments	Week Due	Mark	Aligned CILOs (symbols)
1	Logbook/reports	Weekly	10	a1, b1, c1, c3, d1-d2
Total			10	

VII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1.	**Field supervisor** - Behaviours: 10% - Assignments & activities 20%	Daily	30	30%	a1-a2, b1, c1-c3, d1-d2

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
2.	**Academic supervisor** - Logbook/reports 10% - Behaviours: 10% - Seminars 10%	Weekly	30	30%	a1-a2, b1, c1-c3, d1-d2
3.	**Training committee** - Attendance 10% - Final exam 30%	At the end	40	40%	a1-a2, b1, c1-c3, d1
Total			**100**	**100%**	

VIII. Learning Resources:

- *Written in the following order:* Author, Year of publication, Title, Edition, Place of publication Publisher.

1- Required Textbook(s) (maximum two):

1- Kevin Taylor and Geoffrey Harding (Editors), 2005. Pharmacy Practice. Published by Taylor and Francis.

2- Krinsky et al. (2015). Handbook of non-prescription drugs – An interactive approach to self-care, 18th edition - American Pharmacists Association (APhA).

Latest editions of all the suggested books are recommended.

2- Essential References:

1- Karin Wledenmayer, Rob Summers et al (Editors), 2006. Developing Pharmacy Practice (Handbook). WHO.

2- Paul Rutter, (2021). Community Pharmacy: Symptoms, Diagnosis and Treatment. fourth edition. Elsevier Ltd.

3- British national formulary

Latest editions of all the suggested books are recommended.

3- Electronic Materials and Web Sites etc.:
Websites: 1- https://www.medscape.com/ 2- https://www.rxlist.com 3- https://www.drugs.com/ **4-** www.fda.gov

Fifth Level, First Semester

Course Specification of Quality Control

I. Course Identification and General Information:

1	**Course Title:**	**Quality control**				
2	**Course Code & Number:**	**PHA536**				
3	**Credit hours:**	C.H				Total
		Th.	Seminar	practical	Training.	
		2		**1**		**3**
4	**Study level/ semester at which this course is offered:**	5th year / 1st semester				
5	**Pre –requisite (if any):**	Pharmaceutical instrumental analysis, Industrial Pharmacy				
6	**Co –requisite (if any):**	**none**				
7	**Program (s) in which the course is offered:**	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	**Language of teaching the course:**	**English / Arabic**				
9	**Study System**	**Semester**				
10	**Mode of delivery:**	**Regular**				
11	**Location of teaching the course:**	**Al-Saeed University campus**				
12	**Prepared By:**	**Dr. Abdulkarim Kassem Alzomor**				

II. Course Description:

This course deals with the various aspects of quality control and quality assurance aspects of pharmaceutical industries. It deals with the important aspects like cGMP, QC tests, documentation, quality certifications and regulatory affairs. This course also involves practical part.

III. Course Objectives:

The aim of the course is to

1- Familiarize the pharmacy students the different aspects of quality assurance and quality control, concerning the quality control laboratories both in the national and industrial level.

2- Introduce students to different chemical, physical, microbiological and biological quality control trends, including the identification, determination of quantity and impurities.

3- Introduce students to recent techniques in drug analysis.

IV.	Course Intended learning outcomes (CILOs) of the course	WRITE Symbol and number of PILOs
a.1	Identify concepts understand the scope of quality certifications applicable to Pharmaceutical industries.	**A2**
a.2	Describe definition and objectives in quality control and understand the cGMP aspects in a pharmaceutical industry	**A2**
b1	Compare the Theoretical considerations and application in drug analysis and quality control of drugs in the different dosage form	**B2**
b.2	Predict the qualitative and quantitative methods for drug evaluation.	**B2**
c.1	Perform the analysis of the data and the different methods of validation and error determination	**C1, C5**
c.2	Employ the knowledge of the different dosage form formulation and analysis and prepare proper documentation, ISO and other accreditation methods	**C1, C5**
d.1	Work effectively in a team	**D1**
d.2	Present ideas clearly, effectively and confidently, in practice skills.	**D1**

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1. Identify concepts understand the scope of quality certifications applicable to Pharmaceutical industries.	- Lectures and Groups discussion. - Practical presentations - Self - learning.	Quizzes, Written exam.
a2. Describe definition and objectives in quality control and understand the cGMP aspects in a pharmaceutical industry.		

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1. Compare the Theoretical considerations and application in drug analysis and quality control of drugs in the different dosage form**.**	- Discussions and Training - Field visits - Problem solving - Practical classes	- Quizzes, Homework - Observation - Task's Evaluates
b2. Predict the qualitative and quantitative methods for drug evaluation.		

(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1. Perform the analysis of the data and the different methods of validation and error determination	- Discussions and Training - Field visits	- Quizzes, Homework - Observation - Task's Evaluates
c2. Employ the knowledge of the		

different dosage form formulation and analysis and prepare proper documentation, ISO and other accreditation methods.	- Problem solving - Practical classes	

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1. Work effectively in a team. d2. Present ideas clearly, effectively and confidently, in practice skills.	- Group discussions - Cooperative learning. - Self – learning - Inductive and deductive	- Homework - Evaluates of Oral Presentation

V. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	contact hours
1	Quality control principle	a1,a2,b1,b2	• Definition • Difference of quality control and quality assurance • Importance of the quality	1	2
2	Documentation	a1, a2, b1, b2, d2	Documents & Records: Log Books, Master Formulas Batch Manufacturing Records Cleaning & Disinfection records Training Records	1	2

			Approvals, Control, retention and disposal of documents and records.		
3	Sampling	a1,a2, b1,b2,d2	Type of sample Sample calculation Tools of sampling	1	2
4	Error	a1, a2 b1,b2,c1, c2	Definition Types Cause of error Proper handling with error	1	2
5	Validation	a1,a2, b1,b2, c1, c2,	- Definition - need of validation - scope of validation - documentation - type of validation	1	2
6	GMP and ISO	a1,a2, d1,d2	- GMP requirement - ISO 9001/ ISO 13485 standards and its implementation -	1	2
7	Mid term exam		- Mid-term exam	1	2
8	Drug stability	a1, a2 b1,b2,c2, d1,d2	- Type of stability - Condition of stability	1	2
9	Analysis of raw materials, finished	a2 b1,b2,c2,	Analysis of raw materials, finished products, packaging	3	6

	products, packaging materials, in process quality control (IPQC),	d1,d2	materials, in process quality control (IPQC), Developing specification, purchase specifications and maintenance of stores for raw materials. In process quality control and finished products quality control for following dosage forms in Pharma industry according to Indian, US and British pharmacopoeias: tablets, capsules, ointments, suppositories, creams, parenteral, ophthalmic and surgical products		
10	Good Laboratory Practices (GLP)	b1,b2,c1, c2, d1,d2	- Requirements of GLP - Head of QC department - Principles - Requirements - QC department Area	2	4
11	Quality control tests for sterile Preperations	b1,b2,c1, c2, d1,d2	- Sterility test - Pyrogen test - Leaker and Clarity test	1	2
12	Revision	a1,a2, b1,b2,c1, c2, d1,d2	-	1	2
13	- Final Exam			1	2
Number of Weeks /and Units Per Semester				**16**	**32**

B - Practical Aspect:

Order	Tasks/ Experiments	Number of Weeks	contact hours	Learning Outcomes
1	Non official tests for tablets (weight uniformity, hard ness and thick ness and diameter)	1	**2**	a1,a2, b1,b2, c1,c2
2	Official tests for tablets (friability, disintegration, dissolution and content uniformity)	2	**4**	a1,a2, b1,b2, c1,c2
3	Official and Non official tests for capsules	2	**4**	a1,a2, b1,b2, c1,c2
4	In-vitro drug release study of the paracetamol enteric coated tablet	1	**2**	a1,a2, b1,b2, c1,c2
5	Sterility test of Ampules and drops.	1	2	a1,a2, b1,b2, c1,c2
6	Quality control test for semisolid dosage form (Cream, Gel Paste and Ointment)	2	**4**	a1,a2, b1,b2, c1,c2
7	Chemical assay of sodium chloride infusion	1	**2**	a1,a2, b1,b2, c1,c2
8	Physicochemical test for Liquid dosage form (solution, emulsion and suspension)	1	**2**	a1,a2, b1,b2, c1,c2
9	Profile dissolution test for ketoprofen tablets	1	**2**	a1,a2, b1,b2, c1,c2
10	Profile dissolution test for omeprazole capsule	1	**2**	a1,a2, b1,b2, c1,c2
11	Final term Exam	1	2	a1,a2, b1,b2, c1,c2
Number of Weeks /and Units Per Semester		**14**	**28**	

VI. Teaching strategies of the course:

- Lectures
- Groups discussion.
- Discussions and Training
- Practical presentations
- Field visits
- Problem solving
- Practical in Lab
- Cooperative learning.
- Simulation Group discussions
- Self – learning
- Inductive and deductive

VII. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Assignments about quality	**a1, a2, b1, b2, c1, c2, d1, d2**	10	5
2	Presentation about validation	**a1, a2, b1, b2, c1, c2, d1.**	12	5

VIII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Assignments	10, 12	10	10%	a1, a2, b1, b2, c1, c2, d1, d2
3	Mid-semester exam of theoretical part (written exam	7	10	10%	a1, a2, c1, b1
4	Quiz. (Practical)	6	10	10%	b1, b2, c1, c2

	Report. (Practical)	10			b2, c1, c2
	Final Exam (Practical)	12	30	30%	a2, b2, c1, c2, d1, d2
5	Final exam of theoretical part (written exam)	15	40	40%	a1, a2, b1, b2, c1, c2, d1, d2
Total			100	100%	

IX. Learning Resources

1- Required Textbook(s) (maximum two).

1- Good laboratory Practice Regulations – Allen F. Hirsch, Volume 38, Marcel Dekker Series, 1989. 7. ICH guidelines

2- ISO 9000 and total quality management

3- The drugs and cosmetics act 1940 – Deshpande, Nilesh Gandhi, 4th edition, Susmit Publishers, 2006.

4- QA Manual – D.H. Shah, 1st edition, Business Horizons, 2000. 11. Good Manufacturing Practices for Pharmaceuticals a plan for total quality control – Sidney H. Willig, Vol. 52, 3rd edition, Marcel Dekker Series.

2- Essential References.

1- Sarker DK. Quality Systems and Controls for Pharmaceuticals. John Wiley & Sons; 2008.

3- Electronic Materials and Web Sites *etc*.

1. www.bookzz.org
2. www.libgen.io
3. http://en-booksee.org

X. Course Policies:

1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will

	not be allowed to attend the final exam
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** - Assignments and projects will be assessed individually unless the teacher request for group work
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:** -

Template for Course Plan (Syllabus) of Quality control

I. Information about Faculty Member Responsible for the Course:								
Name of Faculty Member		Office Hours						
Location& Telephone No.		SAT	SUN	MON	TUE	WED	THU	
E-mail								

II.	Course Identification and General Information:					
1	Course Title:	Quality control				
2	Course Code & Number:	PHA536				
3	Credit hours:	C.H				C.H total
		Th.	Seminar	practical	Training.	
		2		1		3
4	Study level/ semester at which this course is offered:	5th year / 1st semester				
5	Pre –requisite (if any):	Pharmaceutical instrumental analysis, Industrial Pharmacy				
6	Co –requisite (if any):	None				
7	Program (s) in which the course is offered:	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	Language of teaching the course:	English				
9	Study System	Semester				
10	Mode of delivery:	Regular				
11	Location of teaching the course:	Al-Saeed University campus				

III. Course Description:

This course deals with the various aspects of quality control and quality assurance aspects of pharmaceutical industries. It deals with the important aspects like cGMP, QC tests, documentation, quality certifications and regulatory affairs. This course also involves practical part.

IV. Course Objectives:

The aim of the course is to

1- Familiarize the pharmacy students the different aspects of quality assurance and quality control, concerning the quality control laboratories both in the national and industrial level.
2- Introduce students to different chemical, physical, microbiological and biological quality control trends, including the identification, determination of quantity and impurities.
3- Introduce students to recent techniques in drug analysis.

V. Intended learning outcomes (ILOs) of the course:

1- Identify concepts understand the scope of quality certifications applicable to Pharmaceutical industries.
2- Describe definition and objectives in quality control and understand the cGMP aspects in a pharmaceutical industry
3- Predict the qualitative and quantitative methods for drug evaluation
4- Compare the Theoretical considerations and application in drug analysis and quality control of drugs in the different dosage form
5- Perform the analysis of the data and the different methods of validation and error determination
6- Employ the knowledge of the different dosage form formulation and analysis and prepare proper documentation, ISO and other accreditation methods
7- Work effectively in a team
8- Present ideas clearly, effectively and confidently, in practice skills.

VI. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Sub Topics List	Week Due	contact hours
1	Quality control principle	• Definition • Difference of quality control	W1	2

		and quality assurance • Importance of the quality		
2	Documentation	Documents & Records: Log Books, Master Formulas Batch Manufacturing Records Cleaning & Disinfection records Training Records Approvals, Control, retention and disposal of documents and records.	W2	2
3	Sampling	Type of sample Sample calculation Tools of sampling	W3	2
4	Error	Definition Types Cause of error Proper handling with error	W4	2
5	Validation	- Definition - need of validation - scope of validation - documentation - type of validation	W5	2
6	GMP and ISO	- GMP requirement - ISO 9001/ ISO 13485 standards and its implementation	W6	2
7	- **Midterm exam**		W7	2

8	Drug stability	- Type of stability - Condition of stability	W8	2
9	Analysis of raw materials, finished products, packaging materials, in process quality control (IPQC),	Analysis of raw materials, finished products, packaging materials, in process quality control (IPQC), Developing specification, purchase specifications and maintenance of stores for raw materials. In process quality control and finished products quality control for following dosage forms in Pharma industry according to Indian, US and British pharmacopoeias: tablets, capsules, ointments, suppositories, creams, parenteral, ophthalmic and surgical products	W9 , W10, & W11	6
10	Good Laboratory Practices (GLP)	- Requirements of GLP - Head of QC department - Principles - Requirements - QC department Area	W12 & W13	4
11	Quality control tests for sterile Preperations	- Sterility test - Pyrogen test - Leaker and Clarity test	W14	2
12	Revision	-	W15	2
13	- Final term exam		W16	2
Number of Weeks /and Units Per Semester			**16**	**32**

B – Practical Aspect:			
Order	**Tasks/ Experiments**	**Week Due**	**contact hours**
1	Non official test for tablets (weight uniformity, hard ness and thick ness and diameter)	W1	**2**
2	Official test for tablets (friability, disintegration, dissolution and content uniformity)	W2 &W3	**4**
3	Official and Non official test for capsules	W4 &W5	**4**
4	In-vitro drug release study of the paracetamol enteric coated tablet	W6	**2**
5	Sterility test of Ampules and drops.	W7	2
6	Quality control test for semisolid dosage form (Cream, Gel Paste and Ointment)	W8 & W9	**4**
7	Chemical assay of sodium chloride infusion	W10	**2**
8	Physicochemical test for Liquid dosage form (solution, emulsion and suspension)	W11	**2**
9	Profile dissolution test for ketoprofen tablets	W12	**2**
10	Profile dissolution test for omeprazole capsule	W13	**2**
11	Final term	W14	2
Number of Weeks /and Units Per Semester		**14**	**28**

VII. Teaching strategies of the course:

- Lectures
- Groups discussion.
- Discussions and Training
- Practical presentations
- Field visits
- Problem solving
- Practical in Lab

- Cooperative learning.
- Simulation Group discussions
- Self – learning
- Inductive and deductive

VIII. Assignments:			
No	**Assignments**	**Week Due**	**Mark**
1	Assignments about quality	10	5
2	Presentation about validation	12	5

IX. Schedule of Assessment Tasks for Students During the Semester:				
No.	**Assessment Method**	**Week Due**	**Mark**	**Proportion of Final Assessment**
1	Assignments	10, 12	10	10%
3	Mid-semester exam of theoretical part (written exam	7	10	10%
4	Quiz. (Practical)	6	10	10%
	Report. (Practical)	10		
	Final Exam (Practical)	12	30	30%
5	Final exam of theoretical part (written exam)	14	504	40%
Total			100	100%

X. Learning Resources
1- Required Textbook(s) (maximum two).
1- Good Laboratory Practice Regulations – Allen F. Hirsch, Volume 38, Marcel Dekker Series, 1989. 7. ICH guidelines 2- ISO 9000 and total quality management 3- The drugs and cosmetics act 1940 – Deshpande, Nilesh Gandhi, 4th edition, Susmit Publishers,

2006. 4- QA Manual – D.H. Shah, 1st edition, Business Horizons, 2000. 11. Good Manufacturing Practices for Pharmaceuticals a plan for total quality control – Sidney H. Willig, Vol. 52, 3rd edition, Marcel Dekker Series.
2- Essential References.
1- Sarker DK. Quality Systems and Controls for Pharmaceuticals. John Wiley & Sons; 2008.
3- Electronic Materials and Web Sites *etc*.
4. www.bookzz.org 5. www.libgen.io 6. http://en-booksee.org

XI. Course Policies:	
1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam.
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** - Assignments and projects will be assessed individually unless the teacher request for group work.
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course.
6	**Plagiarism**:

	Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:**

Course Specification of Pharmacoepidemiology and Pharmacovigilance

II. Course Identification and General Information:

1	Course Title:	Pharmacoepidemiology and Pharmacovigilance				
2	Course Code & Number:	PHA567				
3	Credit hours:	C.H				TOTAL
		Th.	Seminar	practical	Training.	
		2				2
4	Study level/ semester at which this course is offered:	Fifth level/first semester				
5	Pre –requisite (if any):	Drug Information				
6	Co –requisite (if any):					
7	Program (s) in which the course is offered:	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	Language of teaching the course:	English Language				
9	Study System	Semester				
10	Mode of delivery:	Regular				
11	Location of teaching the course:	University				
12	Prepared By:					

XIII. Course Description:

This course introduces students to the basic concepts and principles of drug safety, pharmacoepidemiology and pharmacovigilance. The course covers pharmacoepidemiologic methods for studies on the utilization, safety, and effectiveness of medications in large number of the population. and their role in pharmacovigilance. The course also covers the importance of pharmacovigilance; types, identification and assessment, prevention, management and reporting of adverse drug reactions (ADRs).

XIV. Course Objectives:

5- To describe the basic concepts and principles of pharmacoepidemiology and pharmacovigilance and their applications in pharmacy practice.
6- To recognize the basic concepts of adverse drug reactions; their classification, identification, assessment, prevention, management and reporting.

XV.	Course Intended learning outcomes (CILOs) of the course	WRITE Symbol and number of PILOs
a.1	Recognize the basic principles of pharmacoepidemiology and pharmacovigilance and their importance for healthcare system.	**A5**
a.2	Describe the study designs used in pharmacoepidemiology and pharmacovigilance.	**A5**
a.3	Demonstrate sound knowledge about classification, identification, assessment, prevention, management and reporting of adverse drug reactions (ADRs).	**A3, A4**
b.1	Plan pharmacovigilance activities.	**B3, B4**
b.2	Identify medication errors and adverse drug reactions.	**B3**
c.1	Apply the principles of pharmacovigilance to promote the rational and safe use of the drugs.	**C4**
d.1	Report medication errors and adverse drug reactions to regulatory authorities.	**D1**
d.2	Apply principles of pharmacoepidemiology to the study of drug use and outcomes in large populations.	**D3**

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1. Recognize the basic principles of pharmacoepidemiology and pharmacovigilance and their importance for healthcare system.	- Interactive Lectures - Assignments - Brain Storming	- Written Exams (midterm and final) - Quizzes - Assignments & Coursework Activities
a2. Describe the study designs used in pharmacoepidemiology and pharmacovigilance.		
a3. Demonstrate sound knowledge about		

classification, identification, assessment, prevention, management and reporting of adverse drug reactions (ADRs).		

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1. Plan pharmacovigilance activities. **b2.** Identify medication errors and adverse drug reactions.	- Interactive Lectures - Assignments - Simulation - Problem-based Learning	- Written Exams (midterm and final) - Assignments & Coursework Activities - Problem Solving Exercise

(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1- Apply the principles of pharmacovigilance to promote the rational and safe use of the drugs.	- Assignments - Problem-based Learning - Self-Learning	- Assignments & Coursework Activities - Problem Solving Exercise

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1. Report medication errors and adverse drug reactions to regulatory authorities. **d2.** Apply principles of pharmacoepidemiology to the study of drug use and outcomes in large populations.	- Assignments - Problem-based Learning - Self-Learning	- Assignments & Coursework Activities - Problem Solving Exercise - ADR report

XVI. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	contact hours
1	**Introduction to pharmacoepidemiology**	**a1, a2, d2**	- Introduction, Terminology - Drug approval process	1	2

			- Importance of pharmacoepidemiology		
2	**Study designs used in pharmacoepidemiology research**	**a1, a2, d2**	- Ecological/cross-sectional studies - Case-control studies - Cohort studies	2	4
3	**Pharmacovigilance**	**a1**	- Definition of the terminologies - Importance of pharmacovigilance - Scope of pharmacovigilance - Objectives of pharmacovigilance - WHO program for international drug monitoring. - National pharmacovigilance center.	1	2
4	**Adverse drug reactions (ADRs)**	**a3, b1, b2, c1, d1**	- Definition and classification of ADRs - Detection and reporting - Causality assessment - Severity and seriousness assessment - Predictability and preventability assessment - Management of ADRs	3	6
5	**Mid-term exam**	**a1-a3, b1, b2, c1, d1, d2**		1	2
6	**Pharmacovigilance methods**	**a3, b1, b2, c1, d1**	- Passive surveillance: spontaneous reports, case report and case series - Stimulated reporting - Active surveillance: sentinel sites, drug event monitoring and registries - Comparative	2	4

			observational studies: cross-sectional study, case control study and cohort study. - Targeted clinical investigation		
7	**Adverse drug reactions reporting**	**a3, b1, b2, c1, d1**	- Introduction to reporting system - Spontaneous reporting system - Reporting to regulatory authorities - Guidelines for reporting ADRs.	3	6
8	**Signal detection, risk assessment and management**	**a3, b1, b2, c1, d1**	- Identification of new adverse drug reactions - Signal detection in pre and post marketing period - Prioritization and risk assessment - Risk management.	2	4
9	**Final term exam**	**a1-a3, b1, b2, c1, d1**		1	2
Number of Weeks /and Units Per Semester				**16**	**32**

XVII. Teaching strategies of the course:

- Interactive Lectures
- Assignments
- Brain Storming
- Simulation
- Problem-based Learning
- Self-Learning

VIII. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Participation, Homework Assignments	**a1-a3, b1, b2, c1, d1-d2**	Weekly	**2.5**
2	Exercises	**b1, b2, c1, d1-d2**	Weekly	**2.5**
3	**Total**			**5**

XIX. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Tasks and Assignments	**1-14**	**5**	5%	**a1-a3, b1, b2, c1, d1**
2	Quizzes 1	**W6**	2.5	2.5%	**a1, a2, a3**
3	Mid-term exam	**W7**	20	20%	**a1-a3, b1, b2, c1, d1, d2**
4	Quizzes 2	**W12**	2.5	2.5%	**a1, a2, a3**
5	Final exam	**W16**	70	70	**a1-a3, b1, b2, c1, d1, d2**
6	**Total**		**100**	**100**	

XX. Learning Resources:

1- Required Textbook(s) (maximum two).

1- Brian L. Storm, Stephen E. Kimmel and Sean Hennessy. 2022. Textbook of pharmacoepidemiology. Third edition. John Wiley & Sons Ltd.
2- Tripathi, Shukla. S. S and Pandey. R. K. 2019. Pharmacovigilance. First edition. Nirali Prakashan.

2- Essential References.

1- Thomas, D. (editor). 2019. Clinical pharmacy education, practice and research. First edition. Elsevier Inc.
2- Zaheer-UD-Din Baber (editor), 2019. Encyclopedia of pharmacy practice and clinical pharmacy. First edition. Elsevier Inc.

3- Electronic Materials and Web Sites *etc.*

1-
2-
3-

XXI.	Course Policies:
1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** Assignments and projects will be assessed individually unless the teacher request for group work
5	**Cheating**: Cheating by any means will cause the student failure and he/she must re-study the course
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:** -

Template for Course Plan (Syllabus) of Pharmacoepidemiology and Pharmacovigilance

XVI. - Information about Faculty Member Responsible for the Course:

		Office Hours					
Name of Faculty Member							
Location& Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

XVII. Course Identification and General Information:

	Course Title:	Pharmacoepidemiology and Pharmacovigilance				
1.	Course Number & Code:	PHA567				
2.	Credit hours:	C.H				Total
		Th.	Seminar	Pr.	F. Tr.	
		2				2
3.	Study level/year at which this course is offered:	Fifth level/first semester				
4.	Pre –requisite (if any):	Drug Information				
5.	Co –requisite (if any):					
6.	Program (s) in which the course is offered	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
7.	Language of teaching the course:	English Language				
8.	System of Study:	Semester				
9.	Mode of delivery:	Regular				
10.	Location of teaching the course:	University				

XVIII. Course Description:

This course introduces students to the basic concepts and principles of drug safety, pharmacoepidemiology and pharmacovigilance. The course covers pharmacoepidemiologic methods for studies on the utilization, safety, and effectiveness of medications in large number of the population. and their role in pharmacovigilance. The course also covers the importance of pharmacovigilance; types, identification and assessment, prevention, management and reporting of adverse drug reactions (ADRs).

XIX. Course Objectives:

5- To describe the basic concepts and principles of pharmacoepidemiology and pharmacovigilance and their applications in pharmacy practice.

6- To recognize the basic concepts of adverse drug reactions; their classification, identification, assessment, prevention, management and reporting.

XX. Intended learning outcomes (ILOs) of the course:

- Brief summary of the knowledge or skill the course is intended to develop:

1- Recognize the basic principles of pharmacoepidemiology and pharmacovigilance and their importance for healthcare system.
2- Describe the study designs used in pharmacoepidemiology and pharmacovigilance.
3- Demonstrate sound knowledge about classification, identification, assessment, prevention, management and reporting of adverse drug reactions (ADRs).
4- Plan pharmacovigilance activities.
5- Identify medication errors and adverse drug reactions.
6- Apply the principles of pharmacovigilance to promote the rational and safe use of the drugs.
7- Report medication errors and adverse drug reactions to regulatory authorities.
8- Apply principles of pharmacoepidemiology to the study of drug use and outcomes in large populations.

XXI. Course Content:

- Distribution of Semester Weekly Plan of Course Topics/Items and Activities.

A – Theoretical Aspect:

Order	Topics List	Week Due	Contact Hours
1	**Introduction to pharmacoepidemiology** - Introduction, Terminology - Drug approval process - Importance of pharmacoepidemiology	1st	2
2	**Study designs used in pharmacoepidemiology research** - Ecological/cross-sectional studies	2nd & 3rd	4

	- Case-control studies - Cohort studies		
3	**Pharmacovigilance** - Definition of the terminologies - Importance of pharmacovigilance - Scope of pharmacovigilance - Objectives of pharmacovigilance - WHO program for international drug monitoring. - National pharmacovigilance center.	4th	2
4	**Adverse drug reactions (ADRs)** - Definition and classification of ADRs - Detection and reporting - Causality assessment - Severity and seriousness assessment - Predictability and preventability assessment - Management of ADRs	5th, 6th & 7th	6
5	**Mid-term exam**	8th	2
6	**Pharmacovigilance methods** - Passive surveillance: spontaneous reports, case report and case series - Stimulated reporting - Active surveillance: sentinel sites, drug event monitoring and registries - Comparative observational studies: cross-sectional study, case control study and cohort study. - Targeted clinical investigation	9th & 10th	4
7	**Adverse drug reactions reporting** - Introduction to reporting system - Spontaneous reporting system	11th, 12th & 13th	6

	- Reporting to regulatory authorities - Guidelines for reporting ADRs.		
8	**Signal detection, risk assessment and management** - Identification of new adverse drug reactions - Signal detection in pre and post marketing period - Prioritization and risk assessment - Risk management.	14th & 15th	4
9	**Final term exam**	16th	2
Number of Weeks /and Units Per Semester		**16**	**32**

XXII. Teaching strategies of the course:

- Interactive Lectures
- Assignments
- Brain Storming
- Simulation
- Problem-based Learning
- Self-Learning

XXIII. Assignments:

No	Assignments	Week Due	Mark
1	Participation, Homework Assignments	Weekly	**2.5**
2	Exercises	Weekly	**2.5**
3	**Total**		**5**

XXIV. Schedule of Assessment Tasks for Students During the Semester:

Assessment	Type of Assessment Tasks	Week Due	Mark	Proportion of Final Assessment
1	Tasks and Assignments	**1-14**	**5**	5%
2	Quizzes 1	**W6**	2.5	2.5%
3	Mid-term exam	**W7**	20	20%
4	Quizzes 2	**W12**	2.5	2.5%

5	Final exam	**W16**	70	70
6	**Total**		**100**	**100**

XXV. Learning Resources:

1- Required Textbook(s) (maximum two).

1- Brian L. Storm, Stephen E. Kimmel and Sean Hennessy. 2022. Textbook of pharmacoepidemiology. Third edition. John Wiley & Sons Ltd.
2- Tripathi, Shukla. S. S and Pandey. R. K. 2019. Pharmacovigilance. First edition. Nirali Prakashan.

2- Essential References.

1- Thomas, D. (editor). 2019. Clinical pharmacy education, practice and research. First edition. Elsevier Inc.
2- Zaheer-UD-Din Baber (editor), 2019. Encyclopedia of pharmacy practice and clinical pharmacy. First edition. Elsevier Inc.

3- Electronic Materials and Web Sites *etc*.

XXVI. Course Policies:

1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** Assignments and projects will be assessed individually unless the teacher request for group work
5	**Cheating**: Cheating by any means will cause the student failure and he/she must re-study the course
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:**

Course Specification of Therapeutics (2)

I.	Course Identification and General Information:					
1	**Course Title:**	Therapeutics (2)				
2	**Course Code & Number:**	**PHA587**				
3	**Credit hours:**	C.H				Total
		Th.	Seminar	Pr	Tr.	
		2	----	1	----	3
4	**Study level/ semester at which this course is offered:**	**5 Level / 1 Semester**				
5	**Pre –requisite (if any):**	Therapeutics (1)				
6	**Co –requisite (if any):**	**None**				
7	**Program (s) in which the course is offered:**	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	**Language of teaching the course:**	English Language				
9	**Study System**	Semester				
10	**Mode of delivery:**	Regular				
11	**Location of teaching the course:**	University				
12	**Prepared By:**	**Dr. Mujeeb Al-Nahari**				

II. Course Description:

This course focuses on giving Pharmacy students the knowledge and skills to successfully manage the treatment of patients in the clinical Pharmacy setting. It covers the pathophysiology, clinical manifestations, diagnosis, complications, goals of therapy, treatment options, patient education, drug monitoring and evaluation of the therapeutic outcomes of selected gastrointestinal, renal and respiratory disorders. It also focuses on methods of delivering patient care that will facilitate improving health outcomes through effective communication. The course also includes practical part that involves simulated case studies and visiting to hospital.

III. Course Objectives:

Upon successful completion of the course:

1- The students will be able to describe pathophysiology, clinical manifestation, diagnosis, complications, goal of therapy, treatment plan of gastrointestinal, renal and respiratory disorders.

2- The students will be able to understand the clinical issues of medication use.

3- The students will be able to recommend appropriate treatment plan (nonpharmacological and pharmacological) for individual patients.

4- The students will be able to provide patient education about disease and medications.

IV.	Course Intended learning outcomes (CILOs) of the course	Referenced PILOs
a.1	Demonstrate the etiology, pathophysiology, physical examination, diagnosis, and prognosis of gastrointestinal, renal and respiratory disorders.	**A1**
a.2	Outline the goals of therapy for patients with gastrointestinal, renal and respiratory disorders.	**A1, A3**
a.3	Identify the role of pharmacist in the pharmaceutical care plan of gastrointestinal, renal and respiratory disorders.	**A4**
b.1	Design and evaluate patient care plan for selected gastrointestinal, renal and respiratory disorders.	**B3**
c.1	Use properly drugs regimen and monitoring parameters to achieve targeted therapeutic outcomes of gastrointestinal, renal and respiratory disorders.	**C2**
c.2	Provide an evidence based information to the health care team regarding the rational drug selections.	**C4**
d.1	Search efficiently for required medical information in professional medical references and sites.	**D3**
d.2	Interact effectively and ethically with a healthcare team and patients.	**D1**

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1- Demonstrate the etiology, pathophysiology, phys/ical examination, diagnosis, and prognosis of gastrointestinal, renal and respiratory disorders.	Lectures Discussion Case study Seminar	Written exam, Quizzes Assignment
a2- Outline the goals of therapy for patients with gastrointestinal, renal and respiratory disorders.		
a3-Identify the role of pharmacist in the pharmaceutical care plan of gastrointestinal, renal and respiratory disorders.		

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1- Design and evaluate patient care plan for selected gastrointestinal, renal and respiratory disorders.	Lectures, Discussion, case study, Problem-Solving learning, Field visit	Written exam Assignment, case study Problem-Solving Exercises.

© Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
C1- Use properly drugs regimen and monitoring parameters to achieve targeted therapeutic outcomes of gastrointestinal, renal	Discussion, Practical classes	Practical exam Assignment, case study

and respiratory disorders.	Case study, Problem-Solving learning, Field visit	Problem-Solving Exercises. Reports
C2- Provide an evidence based information to the health care team regarding the rational drug selections.		

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1- Search efficiently for required medical information in professional medical references and sites.	Discussion Cooperative Learning Practical classes Self-learning Seminar	Presentation Observation Assignment and Reports
d2- Interact effectively and ethically with a healthcare team and patients.		

V. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	contact hours
1	**GIT disorders**	a1, a2, a3, b1, c1, c2, d1, d2	Peptic ulcer disease PUD	1	2
			Gastroesophageal Reflux Disease GERD	1	2
			Nausea and vomiting N/V	1	2
			Diarrhea and Constipation	1	2
			Irritable bowel syndrome IBS	1	2
			Pancreatitis	1	2
2	**Midterm Exam**	a1, a2, a3, b1, c1, c2, d1, d2		1	2

3	**GIT disorders**	a1, a2, a3, b1, c1, c2, d1, d2	Viral hepatitis	1	2
			Liver cirrhosis	1	2
4	**Renal disorders**	a1, a2, a3, b1, c1, c2, d1, d2	Acute Kidney Injury	1	2
			Chronic Kidney Disease	1	2
			Acid–Base Disturbances	1	2
5	**Respiratory disorders**	a1, a2, a3, b1, c1, c2, d1, d2	Asthma	1	2
			COPD	1	2
6	**Revision**	a1, a2, a3, b1, c1, c2, d1, d2		1	2
7	**Final Exam**	a1, a2, a3, b1, c1, c2, d1, d2		1	2
Number of Weeks /and Units Per Semester				**16**	**32**

B - Practical Aspect:

Order	Tasks/ Experiments	Number of Weeks	contact hours	Learning Outcomes
1	**Cases on PUD**	1	2	a1, a2, a3, b1, c1, c2, d1, d2
2	**Cases on GERD**	1	2	a1, a2, a3, b1, c1, c2, d1, d2
3	**Cases on Nausea and vomiting**	1	2	a1, a2, a3, b1, c1, c2, d1, d2
4	**Cases on Diarrhea**	1	2	a1, a2, a3, b1, c1, c2, d1, d2
5	**Cases on Constipation**	1	2	a1, a2, a3, b1, c1, c2, d1, d2
6	**Cases on Liver cirrhosis**	1	2	a1, a2, a3, b1, c1, c2, d1, d2
7	**Mid-Term Exam**	1	2	a1, a2, a3, b1, c1, c2, d1, d2
8	**Cases on Acute Kidney Injury**	1	2	a1, a2, a3, b1, c1, c2, d1, d2
9	**Cases on Chronic Kidney Disease**	1	2	a1, a2, a3, b1, c1, c2, d1, d2
10	**Cases on Metabolic Acidosis**	1	2	a1, a2, a3, b1, c1, c2,

				d1, d2
11	**Cases on Asthma**	**1**	2	a1, a2, a3, b1, c1, c2, d1, d2
12	**Cases on COPD**	**1**	2	a1, a2, a3, b1, c1, c2, d1, d2
13	**Revision**	**1**	2	a1, a2, a3, b1, c1, c2, d1, d2
14	**Final Practical Exam**	**1**	2	a1, a2, a3, b1, c1, c2, d1, d2
Number of Weeks /and Units Per Semester		**14**	**28**	

VI. Teaching strategies of the course:

Lectures,
Discussion
Case study
Seminar
Problem-Solving learning
Field visit
Practical classes
Cooperative Learning
Self-learning

VII. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	**Case presentation**	a1, a2, a3, b1, c1, c2, d1, d2	6th and 9th	5
2				

VIII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Assignments	6th and 9th	**5**	5%	a1, a2, a3, b1, c1, c2, d1

2	Participation and Quizzes	All Weeks	**5**	5%	a1, a2, a3, b1, c1, c2, d1
3	Mid-Term Exam (Theory)	**7th**	**10**	10%	a1, a2, a3, b1, c1, c2, d1
4	Reports for cases (Practical)	All Weeks	**10**	10%	a1, a2, a3, b1, c1, c2, d1
5	Final Exam (Practical)	**14th**	**30**	30%	a1, a2, a3, b1, c1, c2, d1
6	Final Exam (Theory)	**16th**	**40**	40%	a1, a2, a3, b1, c1, c2, d1
Total			100	100%	

IX. Learning Resources:

1- Required Textbook(s) (maximum two).

1- Chisholm-Burns, M. A., Wells, B. G., & Schwinghammer, T. L. (2019). Pharmacotherapy principles and practice, 5th edition. New York : McGraw-Hill.

2- Walker & Whittlesea, 2018.Clinical Pharmacy and Therapeutics. 6th edition, Whittlesea, C., & Hodson, K. (2018). Clinical pharmacy and therapeutics, 6th edition. Oxford: Elsevier Health Sciences.

2- Essential References.

1- DiPiro, J. T., Talbert, R. L., Yee, G. C., Matzke, G. R., Wells, B. G., & Posey, L. (2020). Pharmacotherapy A Pathophysiologic Approach, 11th edition. Pharmacotherapy: A Pathophysiologic Approach. New York: McGraw-Hill Education.

2- Zeind, C. S., & Carvalho, M. G. (2018). Applied therapeutics: the clinical use of drugs, 11th edition. Philadelphia: Wolters Kluwer.

3- Electronic Materials and Web Sites *etc*.

1 - www.accesspharmacy.com

2 - Disease management guidelines (specified in lecture notes)

X.	Course Policies:
1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2	**Tardy:** - Any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** - Assignments and projects will be assessed individually unless the teacher request for group work
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:**

Template for Course Plan (Syllabus) Therapeutics (2)

I. Information about Faculty Member Responsible for the Course:								
Name of Faculty Member		**Office Hours**						
Location& Telephone No.		**SAT**	**SUN**	**MON**	**TUE**	**WED**	**THU**	
E-mail								

II. Course Identification and General Information:						
1-	**Course Title:**	Therapeutics (2)				
2-	**Course Number & Code:**	**PHA587**				
3-	**Credit hours:**	C.H				Total
		Th.	Seminar	Pr.	Tr.	
		2	----	1	----	3
4-	**Study level/year at which this course is offered:**	**5 Level / 1 Semester**				
5-	**Pre –requisite (if any):**	Therapeutics (1)				
6-	**Co –requisite (if any):**	None				
7-	**Program (s) in which the course is offered**	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8-	**Language of teaching the course:**	English Language				
9-	**System of Study:**	Semester				
10-	**Mode of delivery:**	Regular				
11-	**Location of teaching the course:**	University				
12-	**Prepared By:**	**Dr. Mujeeb Al-Nahari**				

III. Course Description:

This course focuses on giving Pharmacy students the knowledge and skills to successfully manage the treatment of patients in the clinical Pharmacy setting. It covers the pathophysiology, clinical manifestations, diagnosis, complications, goals of therapy, treatment options, patient education, drug monitoring and evaluation of the therapeutic outcomes of selected gastrointestinal, renal and respiratory disorders. It also focuses on methods of delivering patient care that will facilitate improving health outcomes through effective communication. The course also includes practical part that involves simulated case studies and visiting to hospital.

IV. Course Objectives:

Upon successful completion of the course:

1- The students will be able to describe pathophysiology, clinical manifestation, diagnosis, complications, goal of therapy, treatment plan of gastrointestinal, renal and respiratory disorders.

2- The students will be able to understand the clinical issues of medication use.

3- The students will be able to recommend appropriate treatment plan (nonpharmacological and pharmacological) for individual patients.

4- The students will be able to provide patient education about disease and medications.

V. Intended learning outcomes (ILOs) of the course:

1- Demonstrate the etiology, pathophysiology, physical examination, diagnosis, and prognosis of gastrointestinal, renal and respiratory disorders.

2- Outline the goals of therapy for patients with gastrointestinal, renal and respiratory disorders.

3- Identify the role of pharmacist in the pharmaceutical care plan of gastrointestinal, renal and respiratory disorders.

4- Design and evaluate patient care plan for selected gastrointestinal, renal and respiratory disorders.

5- Use properly drugs regimen and monitoring parameters to achieve targeted therapeutic outcomes of gastrointestinal, renal and respiratory disorders.

6- Provide an evidence based information to the health care team regarding the rational drug selections.

7- Search efficiently for required medical information in professional medical references and sites.

8- Interact effectively and ethically with a healthcare team and patients.

VI. Course Content:

A – Theoretical Aspect:

Order	Topics List	Week Due	Contact Hours

1	**GIT disorders:** - Peptic ulcer disease PUD - Gastroesophageal Reflux Disease GERD - Nausea and vomiting N/V - Diarrhea and Constipation - Irritable bowel syndrome IBS - Pancreatitis	1, 2, 3, 4, 5, 6	12
2	**Midterm Exam**	7	2
3	**GIT disorders:** - Viral hepatitis - Liver cirrhosis	8, 9	4
4	**Renal disorders:** - Acute Kidney Injury - Chronic Kidney Disease - Acid–Base Disturbances	10, 11, 12	6
5	**Respiratory disorders:** - Asthma - COPD	13, 14	4
6	**Revision**	15	2
7	**Final Exam**	16	2
Number of Weeks /and Units Per Semester		**16**	**32**

B – Practical Aspect:			
Order	**Topics List**	**Week Due**	**Contact Hours**
1	Cases on PUD	**1**	2
2	Cases on GERD	**2**	2
3	Cases on Nausea and vomiting	**3**	2
4	Cases on Diarrhea	**4**	2
5	Cases on Constipation	**5**	2
6	Cases on Liver cirrhosis	**6**	2
7	Mid-Term Exam	**7**	2
8	Cases on Acute Kidney Injury	**8**	2
9	Cases on Chronic Kidney Disease	**9**	2
10	Cases on Metabolic Acidosis	**10**	2
11	Cases on Asthma	**11**	2
12	Cases on COPD	**12**	2
13	Revision	**13**	2
14	Final Practical Exam	**14**	2
Number of Weeks /and Units Per Semester		**14**	**28**

VII. Teaching strategies of the course:
Lectures, Discussion Case study Seminar Problem-Solving learning Field visit Practical classes Cooperative Learning Self-learning

VIII. Assignments:			
No	**Assignments**	**Week Due**	**Mark**
1	**Case presentation**	6th and 9th	5
2			

IX. Schedule of Assessment Tasks for Students During the Semester:				
Assessment	**Type of Assessment Tasks**	**Week Due**	**Mark**	**Proportion of Final Assessment**
1	Assignments	6th and 9th	**5**	5%
2	Participation and Quizzes	All Weeks	**5**	5%
3	Mid-Term Exam (Theory)	**7th**	**10**	10%
4	Reports for cases (Practical)	All Weeks	**10**	10%
5	Final Exam (Practical)	**14th**	**30**	30%
6	Final Exam (Theory)	**16th**	**40**	40%
7	**Total**		**100**	100%

X. Learning Resources:

1- Required Textbook(s) (maximum two).

1- Chisholm-Burns, M. A., Wells, B. G., & Schwinghammer, T. L. (2019). Pharmacotherapy principles and practice, 5th edition. New York : McGraw-Hill.

2- Walker & Whittlesea, 2018.Clinical Pharmacy and Therapeutics. 6th edition,

Whittlesea, C., & Hodson, K. (2018). Clinical pharmacy and therapeutics, 6th edition. Oxford: Elsevier Health Sciences.

2- Essential References.

1- DiPiro, J. T., Talbert, R. L., Yee, G. C., Matzke, G. R., Wells, B. G., & Posey, L. (2020). Pharmacotherapy A Pathophysiologic Approach, 11th edition. Pharmacotherapy: A Pathophysiologic Approach. New York: McGraw-Hill Education.

2- Zeind, C. S., & Carvalho, M. G. (2018). Applied therapeutics: the clinical use of drugs, 11th edition. Philadelphia: Wolters Kluwer.

3- Electronic Materials and Web Sites *etc*.

1 - www.accesspharmacy.com

2 - Disease management guidelines (specified in lecture notes)

XI. Course Policies:

1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2	**Tardy:** - Any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.

4	**Assignments & Projects:** - Assignments and projects will be assessed individually unless the teacher request for group work
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course. Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:** -

Course Specification of Pharmaceutical Field Training (2)

I. General Information:

1.	**Course Title:**	**Pharmaceutical Field Training (2)**				
2.	**Course Code:**	**PHA592**				
3.	**Course Type:**	**Program Requirements**				
4.	**Credit Hours:**	**Credit Hours**	**Theory Contact Hours**		**Practical Contact Hours**	
			Lecture	**Tutorial/Seminar**	**Lab**	**Clinical**
		4	--	--	--	160
5.	**Level/ Semester at which this Course is offered:**	Fifth Level / first Semester				
6.	**Pre –Requisite (if any):**	Pharmaceutical Field Training (1)				
7.	**Co –Requisite (if any):**	------				
8.	**Program (s) in which the Course is Offered:**	Bachelor of pharmaceutical sciences				
9.	**Language of Teaching the Course:**					
10.	**Location of Teaching the Course:**	Hospital setting				
11.	**Prepared by:**	Dr. Mujeeb M. Al-Nahari Dr. Bssam Al-Shaibani Hamad Mahmood Mohammed				
12.	**Date and Number of Approval by Council:**					

II. Course Description:

This course is the second of a series of three courses designed to provide students with a variety of practice-based opportunities that apply the knowledge and skills gained during their study. The opportunities will occur in selected hospital and clinical based pharmacy practice sites and structured around a number of formalized activities.

III. Course Intended Learning Outcomes (CILOs): Upon successful completion of the course, students will be able to:		Referenced PILOs	
A. Knowledge and Understanding:			
a1	Demonstrate appropriate depth and breadth of pharmacotherapeutics and disease-related knowledge for a variety of common conditions encountered in different healthcare setting.	**A1**	Demonstrate a broad knowledge of the principles of general, basic and biomedical sciences that are pertinent to practice of pharmacy.
		A3	Explain competently the pharmacological effects, therapeutic efficacy and safety of pharmaceutical and related products.
a2	Describe the hospital pharmacy operations, drug distribution system and legal, professional and regulatory requirement in the hospital pharmacy settings.	**A4**	Describe accurately the roles of pharmacist as a: provider of pharmaceutical care, manager of medication use systems and promoter of the public healthcare and wellness.
		A5	Demonstrates sound knowledge and understanding of the concepts and principles related to social/behavioral and administrative sciences to optimize the therapeutic outcomes of medication use.
B. Intellectual Skills:			
b1	Correlate the patient and drug information to identify the medication-related problems and health related needs and recommend the appropriate	**B3**	Practice thinking skills in designing pharmaceutical plans to optimize medication use and

	pharmaceutical plan under the preceptor 's supervision.		reduce the possibility of medication errors, and in solving problems related to pharmaceutical preparations and other related sciences.
		B4	Integrate knowledge of pharmaceutical sciences with social, behavioral, administrative; and clinical sciences to enhance the healthcare systems including pharmaceutical industries.
C. Professional and Practical Skills:			
c1	Develop a pharmaceutical care plan using evidence- based medicine for specific related diseases under the preceptor 's supervision.	**C2**	Provide pharmaceutical care, where appropriate, within the pharmacist scope of practice and expertise and in accordance with GPP and GCP, where applicable.
c2	Accurately process the prescription orders according to professional standards and legal guidelines, under the preceptor 's supervision.		
		C5	Comply with the ethics, laws, regulations and standards of the pharmacy profession.
c3	Participate in inventory management and purchasing including ordering, receiving, storing, and returning products.	**C3**	Employ efficiently the management and technical skills and human, financial and physical resources to manage medication use and distribution systems.
c4	Counsel the patients, caregivers and other healthcare professionals about the appropriate use of medications, devices, health promotion and disease prevention under the preceptor 's supervision.	**C4**	Provide counselling and advise to patients, their families, community and other health care professionals about safe and rational use of medicines and medical devices, self-care and health promotion and disease prevention.

D. Transferable Skills:			
d1	Demonstrate time management, team work, communication, life-long learning skills and professionalism.	**D1**	Demonstrate good ability at effective management and leadership, critical thinking, problem solving, communication skills, use of modern technology, and collaboration with others.
		D2	Develop his/her scientific and professional capabilities, especially in the field of pharmaceutical practice, and continues his/her graduate studies and continuous learning to enhance professional competence.
d2	Utilize the appropriate information resources to provide accurate and credible information about health and drugs.	**D3**	Assess the requirements of research and resources of Information related to drug discovery, development of pharmaceutical products and pharmaceutical-care practice**.**
I= Introduced, P=Practiced or M/A= Mastered/Advanced			

IV. Alignment of Course Intended Learning Outcomes

(A) Alignment of Course Intended Learning Outcomes (Knowledge and Understanding) to Teaching Strategies and Assessment Methods:

	Course Intended Learning Outcomes	Teaching Strategies	Assessment Strategies
a1	Demonstrate appropriate depth and breadth of pharmacotherapeutics and disease-related knowledge for a variety of common	- Case-Study - Self-Learning - Projects	- Oral Exams - Oral Presentation & Seminar Assessment -Assignments &

	conditions encountered in different healthcare setting.	- Discussion - Field-training	Coursework Activities -Reports of Assignments -Cases Presentation
a2	Describe the hospital pharmacy operations, drug distribution system and legal, professional and regulatory requirement in the hospital pharmacy settings.		

(B) Alignment of Course Intended Learning Outcomes (Intellectual Skills) to Teaching Strategies and Assessment Methods:

	Course Intended Learning Outcomes	Teaching Strategies	Assessment Strategies
b1	Correlate the patient and drug information to identify the medication-related problems and health related needs and recommend the appropriate pharmaceutical plan under the preceptor 's supervision.	- Feedback learning - Case-Study - Feedback learning - Projects - Discussion - Problem-based Learning - Field-training - Simulation - Cooperative learning	- Oral Presentation & Seminar Assessment - Assignments and reports - observation - Problem Solving Exercise - Cases Presentation

(C) Alignment of Course Intended Learning Outcomes (Professional and Practical Skills) to Teaching Strategies and Assessment Methods:

	Course Intended Learning Outcomes	Teaching Strategies	Assessment Strategies
c1	Develop a pharmaceutical care plan using evidence-based medicine for specific related diseases under the preceptor 's supervision.	- Feedback learning - Case-Study - Feedback learning - Projects - Problem-based	- Assignments & Coursework Activities - Problem Solving Exercise
c2	Accurately process the prescription orders according		

	to professional standards and legal guidelines, under the preceptor 's supervision.	Learning - Field-training - Simulation - Cooperative learning	- Cases Presentation - Work samples, such as, Pharmacy Practice Manual, Logbooks and Portfolios Multi-source assessments, such as Student Self-Assessment
c3	Participate in inventory management and purchasing including ordering, receiving, storing, and returning products.		
c4	Counsel the patients, caregivers and other healthcare professionals about the appropriate use of medications, devices, health promotion and disease prevention under the preceptor 's supervision.		

(D) Alignment of Course Intended Learning Outcomes (Transferable Skills) to Teaching Strategies and Assessment Methods:

	Course Intended Learning Outcomes	Teaching Strategies	Assessment Strategies
d1	Demonstrate time management, team work, communication, life-long learning skills and professionalism.	- Feedback learning - Case-Study - Feedback learning - Projects - Discussion - Problem-based Learning - Field-training - Simulation - Computer aided learning - Cooperative learning	- Oral Presentation & Seminar Assessment - Assignments & Coursework Activities - Problem Solving Exercise - Cases Presentation - Work samples, such as, Pharmacy Practice Manual, Logbooks and Portfolios
d2	Utilize the appropriate information resources to provide accurate and credible information about health and drugs.		

V. Course Contents:

Practical Aspect (field training):

No.	Tasks/ Experiments	Number of Weeks	Contact Hours 18hrs/week	Learning Outcomes (CILOs)
1	**Hospital pharmacy:** - Hospital pharmacy organization - Roles of pharmacist - Rotation in the pharmacy department's working areas - Hospital formulary - Pharmacy and therapeutic committee - Prescription processing - Various drug distribution system - Sterile aseptic area (I.V. admixture and TPN) - Specific drugs such as narcotics, emergency and controlled drugs. - Drug procurement, inventory control and storage conditions.	4.5	80	a1, a2, b1, c2-c4, d1-d2
2	**Clinical pharmacy: inpatient (internal medicine)** - Daily rounds and morning meetings with the assigned medical team. - Identification of actual and potential drug therapy related problems. - Preparation of a detailed pharmaceutical care plan for patients assigned by the preceptor using the pharmacist's patient care	4.5	80	a1, b1, c1, c2, c4, d1-d2

No.	Tasks/ Experiments	Number of Weeks	Contact Hours 18hrs/week	Learning Outcomes (CILOs)
	process and SOAP note. - Patient case presentation.			
3	**Clinical pharmacy: inpatient (cardiology)** - Daily rounds and morning meetings with the assigned medical team. - Identification of actual and potential drug therapy related problems. - Preparation of a detailed pharmaceutical care plan for patients assigned by the preceptor using the pharmacist's patient care process and SOAP note. - Patient case presentation.			
Number of Weeks /and Units Per Semester		**9**	**160**	

VI. Assignments:

No.	Assignments	Week Due	Mark	Aligned CILOs (symbols)
1.	**Logbook/reports**	**Weekly**	**10**	**a1, b1, c1, c2, c4, d1-d2**
Total			**10**	

VII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1.	**Field supervisor** - Behaviours: 10% - Assignments & activities	Daily	30	30%	**a1-a2, b1, c1-c4, d1-d2**

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
	20%				
2.	**Academic supervisor** - Logbook/reports 10% - Behaviours: 10% - Seminars 10%	Weekly	30	30%	**a1-a2, b1, c1-c4, d1-d2**
3	**Training committee** - Attendance 10% - Final exam 30%	At the end	40	40%	**a1-a2, b1, c1-c4, d1**
Total			**100**	**100**	

VIII. Learning Resources:

1- Required Textbook(s) (maximum two):

5- Karin Wledenmayer, Rob Summers et al (Editors), 2006. Developing Pharmacy Practice (Handbook). WHO.

6- Chisholm-Burns, M. A., Wells, B. G., & Schwinghammer, T. L. (2019). Pharmacotherapy principles and practice, 5th edition. New York : McGraw-Hill.

Latest editions of all the suggested books are recommended.

2- Essential References:

7- DiPiro, J. T., Talbert, R. L., Yee, G. C., Matzke, G. R., Wells, B. G., & Posey, L. (2020). Pharmacotherapy A Pathophysiologic Approach, 11th edition. Pharmacotherapy: A Pathophysiologic Approach. New York: McGraw-Hill Education.

8- Cipolle. 2012, 3rd edition. Pharmaceutical Care Practice: The Patient-Centered Approach to Medication Management Services.

Latest editions of all the suggested books are recommended.

3- Electronic Materials and Web Sites etc.:

1- www.accesspharmacy.com
2- Disease management guidelines
3- https://www.medscape.com/

Fifth level, second semester

Course Specification of Therapeutic (3)

I. Course Identification and General Information:

1	**Course Title:**	Therapeutic (3)				
2	**Course Code & Number:**	PHA588				
3	**Credit hours:**	C.H				Total
		Th.	Seminar	Pr	Tr.	
		2	----	1	----	3
4	**Study level/ semester at which this course is offered:**	5 Level / 2 Semester				
5	**Pre –requisite (if any):**	Therapeutics (2)				
6	**Co –requisite (if any):**	None				
7	**Program (s) in which the course is offered:**	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	**Language of teaching the course:**	English				
9	**Study System**	Semester based System				
10	**Mode of delivery:**	Regular				
11	**Location of teaching the course:**	University campus				
12	**Prepared By:**	Dr. Mujeeb Al-Nahari				

II. Course Description:

This course focuses on giving Pharmacy students the knowledge and skills to successfully manage the treatment of patients in the clinical Pharmacy setting. It covers the pathophysiology, clinical manifestations, diagnosis, complications, goals of therapy, treatment options, patient education, drug monitoring and evaluation of the therapeutic outcomes of selected infectious, blood, neurological, dermatological and oncology disorders. It also focuses on methods of delivering patient care that will facilitate improving health outcomes through effective communication. The course also includes practical part that involves simulated case studies and visiting to hospital.

III. Course Objectives:

Upon successful completion of the course:

1- The students will be able to describe pathophysiology, clinical manifestation, diagnosis, complications, goal of therapy, treatment plan of infectious, blood, neurological, dermatological and oncology disorders.

2- The students will be able to understand the clinical issues of medication use.

3- The students will be able to recommend appropriate treatment plan (nonpharmacological and pharmacological) for individual patients.

4- The students will be able to provide patient education about disease and medications.

IV. Course Intended learning outcomes (CILOs) of the course (maximum 8CILOs)		Referenced PILOs (Only write code number of referenced Program Intended learning outcomes)
a.1	Demonstrate the etiology, pathophysiology, physical examination, diagnosis, and prognosis of infectious, blood, neurological, dermatological and oncology disorders.	A1
a.2	Outline the goals of therapy for patients with infectious, blood, neurological, dermatological and oncology disorders.	A1, A3
a.3	Identify the role of pharmacist in the pharmaceutical care plan of infectious, blood, neurological, dermatological and oncology disorders.	A4
b.1	Design and evaluate patient care plan for selected infectious, blood, neurological, dermatological and oncology disorders.	B3
c.1	Use properly drugs regimen and monitoring parameters to achieve targeted therapeutic outcomes of infectious, blood, neurological, dermatological and oncology disorders.	C2
c.2	Provide an evidence based information to the health care	C4

	team regarding the rational drug selections.	
d.1	Search efficiently for required medical information in professional medical references and sites.	D3
d.2	Interact effectively and ethically with a healthcare team and patients.	D1

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1- Demonstrate the etiology, pathophysiology, physical examination, diagnosis, and prognosis of Infectious, Blood, Neurological, Dermatological and Oncology disorders.	Lectures Discussion Case study Seminar	Written exam, Quizzes Assignment
a2- Outline the goals of therapy for patients with Infectious, Blood, Neurological, Dermatological and Oncology disorders.		
a3- Identify the role of pharmacist in the pharmaceutical care plan of Infectious, Blood, Neurological, Dermatological and Oncology disorders.		

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1- Design and evaluate patient care plan for selected infectious, blood, neurological, dermatological and oncology disorders.	Lectures, Discussion, case study, Problem-Solving learning, Field visit	Written exam Assignment, case study Problem-Solving Exercises.

© Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
C1- Use properly drugs regimen and monitoring parameters to achieve targeted therapeutic outcomes of Infectious, Blood, Neurological, Dermatological and Oncology disorders.	Discussion, Practical classes Case study, Problem-Solving learning, Field visit	Practical exam Assignment, case study Problem-Solving Exercises. Reports
C2- Provide an evidence based information to the health care team regarding the rational drug selections.		

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1- Search efficiently for required medical information in professional medical references and sites.	Discussion Cooperative Learning Practical classes Self-learning Seminar	Presentation Observation Assignment and Reports
d2- Interact effectively and ethically with a healthcare team and patients.		

V. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	contact hours
1	**Infectious diseases**	a1, a2, a3, b1, c1, c2, d1, d2	Systematic Approach for Selection of Antimicrobials	1	2

			Upper Respiratory Tract Infections	1	2
			Lower Respiratory Tract Infections	2	4
			Meningitis	1	2
			Urinary Tract Infections	1	2
3	**Midterm Exam**	a1, a2, a3, b1, c1, c2, d1,		1	2
3	**Infectious diseases**	a1, a2, a3, b1, c1, c2, d1, d2	Skin and Soft-Tissue Infections	1	2
			Superficial Fungal Infection	1	2
			Intra-Abdominal Infections	1	2
4	**Blood disorders**	a1, a2, a3, b1, c1, c2, d1, d2	Anemia	1	2
5	**Neurological disorders**	a1, a2, a3, b1, c1, c2, d1, d2	Epilepsy	1	2
6	**Dermatological disorders**	a1, a2, a3, b1, c1, c2, d1, d2	Acne vulgaris	1	2
7	**Oncology**	a1, a2, a3, b1, c1, c2, d1, d2	Breast Cancer	1	2
8	**Revision**	a1, a2, a3, b1, c1, c2, d1, d2		1	2
9	**Final Exam**	a1, a2, a3, b1, c1, c2, d1,		1	2
Number of Weeks /and Units Per Semester				**16**	**32**

B - Practical Aspect:				
Order	**Tasks/ Experiments**	**Number of Weeks**	**contact hours**	**Learning Outcomes**
1	Cases on URTI	**1**	2	a1, a2, a3, b1, c1, c2, d1, d2
2	Cases on Pneumonia	**1**	2	a1, a2, a3, b1, c1, c2, d1, d2
3	Cases on bronchitis	**1**	2	a1, a2, a3, b1, c1, c2, d1, d2
4	Cases on Meningitis	**1**	2	a1, a2, a3, b1, c1, c2, d1, d2
5	Cases on UTI	**1**	2	a1, a2, a3, b1, c1, c2, d1, d2
6	Cases on Cellulitis	**1**	2	a1, a2, a3, b1, c1, c2, d1, d2
7	Mid-Term Exam	**1**	2	a1, a2, a3, b1, c1, c2, d1, d2
8	Cases on Candida Vaginitis	**1**	2	a1, a2, a3, b1, c1, c2, d1, d2
9	Cases on Peritonitis	**1**	2	a1, a2, a3, b1, c1, c2, d1, d2
10	Cases on Anemia	**1**	2	a1, a2, a3, b1, c1, c2, d1, d2
11	Cases on Epilepsy	**1**	2	a1, a2, a3, b1, c1, c2, d1, d2
12	Cases on Acne vulgaris	**1**	2	a1, a2, a3, b1, c1, c2, d1, d2
13	Revision	**1**	2	a1, a2, a3, b1, c1, c2, d1, d2
14	Final Practical Exam	**1**	2	a1, a2, a3, b1, c1, c2, d1, d2
Number of Weeks /and Units Per Semester		**14**	**28**	

VI. Teaching strategies of the course:

Lectures,
Discussion
Case study
Seminar
Problem-Solving learning
Field visit
Practical classes
Cooperative Learning
Self-learning

VII. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	**Case presentation**	a1, a2, a3, b1, c1, c2, d1, d2	6th and 9th	5
2				

VIII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Assignments	6th and 9th	**5**	5%	a1, a2, a3, b1, c1, c2, d1
2	Participation and Quizzes	All Weeks	**5**	5%	a1, a2, a3, b1, c1, c2, d1
3	Mid-Term Exam (Theory)	**7th**	**10**	10%	a1, a2, a3, b1, c1, c2, d1
4	Reports for cases (Practical)	All Weeks	**10**	10%	a1, a2, a3, b1, c1, c2, d1
5	Final Exam (Practical)	**14th**	**30**	30%	a1, a2, a3, b1, c1, c2, d1
6	Final Exam (Theory)	**16th**	**40**	40%	a1, a2, a3, b1, c1,

					c2, d1
Total			100	100%	

IX. Learning Resources:

1- Required Textbook(s) (maximum two).

1- Chisholm-Burns, M. A., Wells, B. G., & Schwinghammer, T. L. (2019). Pharmacotherapy principles and practice, 5th edition. New York : McGraw-Hill.

2- Walker & Whittlesea, 2018.Clinical Pharmacy and Therapeutics. 6th edition, Whittlesea, C., & Hodson, K. (2018). Clinical pharmacy and therapeutics, 6th edition. Oxford: Elsevier Health Sciences.

2- Essential References.

1- DiPiro, J. T., Talbert, R. L., Yee, G. C., Matzke, G. R., Wells, B. G., & Posey, L. (2020). Pharmacotherapy A Pathophysiologic Approach, 11th edition. Pharmacotherapy: A Pathophysiologic Approach. New York: McGraw-Hill Education.

2- Zeind, C. S., & Carvalho, M. G. (2018). Applied therapeutics: the clinical use of drugs, 11th edition. Philadelphia: Wolters Kluwer.

3- Electronic Materials and Web Sites *etc*.

1 - www.accesspharmacy.com

2 - Disease management guidelines (specified in lecture notes)

X. Course Policies:

1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2	**Tardy:**

	- Any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** - Assignments and projects will be assessed individually unless the teacher request for group work
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:** -

Template for Course Plan (Syllabus) of Therapeutic (3)

I. - Information about Faculty Member Responsible for the Course:

Name of Faculty Member		**Office Hours**					
Location& Telephone No.		**SAT**	**SUN**	**MON**	**TUE**	**WED**	**THU**
E-mail							

II. Course Identification and General Information:

	Course Title:	**Therapeutic (3)**				
1	**Course Number & Code:**	**PHA558**				
2	**Credit hours:**	**C.H**				**Total**
		Th.	**Seminar**	**Pr.**	**F. Tr.**	
		2	----	1	-----	3
3	**Study level/year at which this course is offered:**	5 Level / 2 Semester				
4	**Pre –requisite (if any):**	**Therapeutic (2)**				
5	**Co –requisite (if any):**	None				
6	**Program (s) in which the course is offered**	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
7	**Language of teaching the course:**	English				
8	**System of Study:**	Semester based System				
9	**Mode of delivery:**	Regular				
10	**Location of teaching the course:**	University campus				

III. Course Description:

This course focuses on giving Pharmacy students the knowledge and skills to successfully manage the treatment of patients in the clinical Pharmacy setting. It covers the pathophysiology, clinical

manifestations, diagnosis, complications, goals of therapy, treatment options, patient education, drug monitoring and evaluation of the therapeutic outcomes of selected infectious, blood, neurological, dermatological and oncology disorders. It also focuses on methods of delivering patient care that will facilitate improving health outcomes through effective communication. The course also includes practical part that involves simulated case studies and visiting to hospital.

IV. Course Objectives:

Upon successful completion of the course:

1- The students will be able to describe pathophysiology, clinical manifestation, diagnosis, complications, goal of therapy, treatment plan of infectious, blood, neurological, dermatological and oncology disorders.

2- The students will be able to understand the clinical issues of medication use.

3- The students will be able to recommend appropriate treatment plan (nonpharmacological and pharmacological) for individual patients.

4- The students will be able to provide patient education about disease and medications.

V. Intended learning outcomes (ILOs) of the course:

1- Demonstrate the etiology, pathophysiology, physical examination, diagnosis, and prognosis of infectious, blood, neurological, dermatological and oncology disorders.

2- Outline the goals of therapy for patients with infectious, blood, neurological, dermatological and oncology disorders.

3- Identify the role of pharmacist in the pharmaceutical care plan of infectious, blood, neurological, dermatological and oncology disorders.

4- Design and evaluate patient care plan for selected infectious, blood, neurological, dermatological and oncology disorders.

5- Use properly drugs regimen and monitoring parameters to achieve targeted therapeutic outcomes of infectious, blood, neurological, dermatological and oncology disorders.

6- Provide an evidence based information to the health care team regarding the rational drug selections.

7- Search efficiently for required medical information in professional medical references and sites.

8- Interact effectively and ethically with a healthcare team and patients.

VI. Course Content:

A – Theoretical Aspect:

Order	Topics List	Week Due	Contact Hours
1	**Infectious diseases:** - Systematic Approach for Selection of Antimicrobials - Upper Respiratory Tract Infections - Lower Respiratory Tract Infections - Meningitis - Urinary Tract Infections	1, 2, 3, 4, 5, 6	12
2	**Midterm Exam**	7	2
3	**Infectious diseases:** - Skin and Soft-Tissue Infections - Superficial Fungal Infection - Intra-Abdominal Infections	8, 9, 10	6
4	**Blood disorders:** Anemia	11	2
5	**Neurological disorders:** Epilepsy	12	2
6	**Dermatological disorders:** Acne vulgaris	13	2
7	**Oncology:** Breast Cancer	14	2
8	**Revision**	15	2
9	**Final Exam**	16	2
Number of Weeks /and Units Per Semester		**16**	**32**

B – Practical Aspect:			
Order	**Topics List**	**Week Due**	**Contact Hours**
1	Cases on URTI	**1**	2
2	Cases on Pneumonia	**2**	2
3	Cases on Meningitis	**3**	2
4	Cases on UTI	**4**	2
5	Cases on Stable Angina	**5**	2
6	Cases on Acute coronary syndrome	**6**	2
7	Cases on Cellulitis	**7**	2
8	Mid-Term Exam	**8**	2
9	Cases on Candida Vaginitis	**9**	2
10	Cases on Peritonitis	**10**	2
11	Cases on Anemia	**11**	2
12	Cases on Acne vulgaris	**12**	2
13	Revision	**13**	2
14	Final Practical Exam	**14**	2
Number of Weeks /and Units Per Semester		**14**	**28**

VII. Teaching strategies of the course:
Lectures, Discussion Case study Seminar Problem-Solving learning Field visit Practical classes Cooperative Learning

Self-learning

Assignments:			
No	**Assignments**	**Week Due**	**Mark**
1	**Case presentation**	6th and 9th	5
2			

VIII. Schedule of Assessment Tasks for Students During the Semester:

Assessment	Type of Assessment Tasks	Week Due	Mark	Proportion of Final Assessment
1	Assignments	6th and 9th	**5**	5%
2	Participation and Quizzes	All Weeks	**5**	5%
3	Mid-Term Exam (Theory)	**7th**	**10**	10%
4	Reports for cases (Practical)	All Weeks	**10**	10%
5	Final Exam (Practical)	**14th**	**30**	30%
6	Final Exam (Theory)	**16th**	**40**	40%
	TOTAL		**100**	100%

IX. Learning Resources:

1- Required Textbook(s) (maximum two).

1- Chisholm-Burns, M. A., Wells, B. G., & Schwinghammer, T. L. (2019). Pharmacotherapy principles and practice, 5th edition. New York : McGraw-Hill.

2- Walker & Whittlesea, 2018.Clinical Pharmacy and Therapeutics. 6th edition, Whittlesea, C., & Hodson, K. (2018). Clinical pharmacy and therapeutics, 6th edition. Oxford: Elsevier Health Sciences.

2- Essential References.

1- DiPiro, J. T., Talbert, R. L., Yee, G. C., Matzke, G. R., Wells, B. G., & Posey, L. (2020).

Pharmacotherapy A Pathophysiologic Approach, 11th edition. Pharmacotherapy: A Pathophysiologic Approach. New York: McGraw-Hill Education. 2- Zeind, C. S., & Carvalho, M. G. (2018). Applied therapeutics: the clinical use of drugs, 11th edition. Philadelphia: Wolters Kluwer.
3- Electronic Materials and Web Sites *etc*.
1 - www.accesspharmacy.com 2 - Disease management guidelines (specified in lecture notes)

X. Course Policies:	
1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** - Assignments and projects will be assessed individually unless the teacher request for group work
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:**

Course Specification of Pharmacoeconomics

XII. Course Identification and General Information:

1	Course Title:	Pharmacoeconomics				
2	Course Code & Number:	PHA589				
3	Credit hours:	C.H				TOTAL
		Th.	Seminar	practical	Training.	
		2				2
4	Study level/ semester at which this course is offered:	Fifth level/second semester				
5	Pre –requisite (if any):	Drug Information				
6	Co –requisite (if any):					
7	Program (s) in which the course is offered:	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	Language of teaching the course:	English Language				
9	Study System	Semester				
10	Mode of delivery:	Regular				
11	Location of teaching the course:	University				
12	Prepared By:					

XIII. Course Description:

This course is designed to provide students with the basic concepts of pharmacoeconomics and its use in healthcare decision-making. The course covers the measurement of costs, assessment of economic, clinical, and humanistic outcomes, the four basic types of pharmacoeconomic research, i.e. cost-minimization analysis, cost-effectiveness analysis, cost-utility analysis, and cost-benefit analysis. In addition, it covers the decision analysis.

XIV. Course Objectives:

7- Describe the basic concepts of pharmacoeconomics and its importance and relationship to clinical pharmacy and pharmacy practice.
8- Determine the difference between the most common types of pharmacoeconomics studies.
9- Define different costing terms, types, and ways of cost calculation.
10- Understand the applicability of decision analysis method.

XXV.	Course Intended learning outcomes (CILOs) of the course	WRITE Symbol and number of PILOs
a.1	Explain the basic concepts and principles of	**A4, A5**

	pharmacoeconomics and its application in drug therapy decision and formulary management.	
a.2	Describe the differences between the types of pharmacoeconomics studies and their advantages and disadvantages.	**A5**
a.3	Identify the different types of costs and outcomes included in pharmacoeconomics evaluation.	**A5**
b.1	Relate the concept of pharmacoeconomics to patient care.	**B3**
b.2	Integrate the pharmacoeconomics principles with knowledge of pharmaceutical and clinical sciences in developing the formulary list.	**B4**
c.1	Apply pharmacoeconomics to drug therapy decision and formulary management.	**C2, C3, C4**
d.1	Communicate and present the economic information.	**D1**

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:

Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1. Explain the basic concepts and principles of pharmacoeconomics and its application of in drug therapy decision and formulary management.	- Interactive Lectures - Self-Learning - Assignments	- Written Exams (midterm and final) - Quizzes - Assignments & Coursework Activities - Multiple Choice Questions (MCQs)
a2. Describe the differences between the four most common types of pharmacoeconomics studies and their advantages and disadvantages.		
a3. Identify the different types of costs and outcomes included in pharmacoeconomics evaluation.		

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1. Relate the concept of pharmacoeconomics to patient care.	- Interactive Lectures - Self-Learning - Assignments - Case-Study - Problem-based Learning	- Written Exams (midterm and final) - Assignments & Coursework Activities - Problem Solving Exercise
b2. Integrate the pharmacoeconomics principles with knowledge of pharmaceutical and clinical sciences in developing the formulary list.		

(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1. Apply pharmacoeconomics to drug therapy decision and formulary management.	- Case-Study - Assignments - Problem-based Learning	- Assignments & Coursework Activities - Problem Solving Exercise

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1- Communicate and present the economic information.	- Case-Study - Assignments - Discussion	- Oral Presentation & Seminar Assessment - Assignments reports & Coursework Activities

XVI. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	contact hours

1	**Introduction to Pharmacoeconomics**	**a1, a2, b1, d1**	- What is pharmacoeconomics? - Why is pharmacoeconomics Important? - Relationship of pharmacoeconomics to Other Research - Types of pharmacoeconomic Studies	1	2
2	**Essential medicines lists and the role of pharmacoeconomic**	**a.1, b1, b2, c1, d1**	- Definition and rationale of essential medicines - Selection of essential medicines - WHO model list of essential medicine and model formulary - Role of pharmacoeconomics in developing essential medicines lists and formulary	1	2
3	**Measuring and estimating costs**	**a3, b1, b2, c1, d1**	- Costing Terms - Cost Categorization and Alternative methods - Perspective	1	2
4		**a3, b1, b2, c1, d1**	- Timing adjustment costs - Resources for cost Estimations - Example - Incremental calculation	1	2
5	**Cost Minimization Analysis (CMA)**	**a2, a3, b1, b2, c1, d1**	- Cost Minimization Analysis (CMA)	1	2
6	**Cost effectiveness Analysis (CEA)**	**a2, a3, b1, b2, c1, d1**	- Cost effectiveness Analysis (CEA) - Presentation of Cost-Effectiveness Analysis	1	2
7	**Cost effectiveness Analysis (CEA)**	**a2, b1, b2, c1,**	- Cost-Effectiveness Grid	1	2

		d1			
8	**Mid-term exam**	**a1-a3, b1, b2, c1, d1**		1	2
9	**Cost effectiveness Analysis (CEA)**	**a2, b1, b2, c1, d1**	- Cost-Effectiveness Plane	1	2
10	**Cost Utility Analysis (CUA)**	**a2, a3, b1, b2, c1, d1**	- Overview of CUA Methods used in determining utilities - Rating scale	1	2
11	**Cost Utility Analysis (CUA)**	**a2, b1, b2, c1, d1**	- Standard Gamble - Time Trade off - Differences between different methods	1	2
12	**Cost Utility Analysis (CUA)**	**a2, a3, b1, b2, c1, d1**	- Calculating QALY - Comparison using the CUA	1	2
13	**Cost Benefit analysis**	**a2, a3, b1, b2, c1, d1**	- Definition - Advantages and Disadvantages of CBA - Conducting a CBA - Calculating Results of Costs and Benefits	1	2
14	**Cost Benefit analysis**	**a2, a3, b1, b2, c1, d1**	- Differences between costs versus benefits - Measuring Indirect and Intangible Benefits - Human Capital Method - Bidding Vehicles	1	2
15	**Decision analysis**	**a1, b1, b2, c1, d1**	- Decision Tree analysis	1	2
16	**Final term exam**	**a1-a3, b1, b2, c1, d1**		1	2
Number of Weeks /and Units Per Semester				**16**	**32**

XVII. Teaching strategies of the course:

- Interactive Lectures
- Self-Learning
- Assignments
- Case-Study
- Problem-based Learning
- Discussion

VIII. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Participation, Homework Assignments	**a1-a3, b1, b2, c1, d1**	Weekly	**2.5**
2	Exercises	**a2, a3, b1, b2, c1, d1**	Weekly	**2.5**
3	**Total**			**5**

XIX. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Tasks and Assignments	**1-14**	**5**	5%	**a1-a3, b1, b2, c1, d1**
2	Quizzes 1	**W6**	2.5	2.5%	**a1, a2, a3, b1, b2**
3	Mid-term exam	**W7**	20	20%	**a1-a3, b1, b2, c1, d1**
4	Quizzes 2	**W12**	2.5	2.5%	**a1, a2, a3, b1, b2**
5	Final exam	**W16**	70	70	**a1-a3, b1, b2, c1, d1**
6	**Total**		**100**	**100**	

XXX. Learning Resources:

1- Required Textbook(s) (maximum two).

1- Karen Rascati. (2014). Essentials of Pharmacoeconomics. 2nd edition, Lippincott Williams & Wilki
2- Thomas, D. (editor). 2019. Clinical pharmacy education, practice and research. First edition. Elsevier Inc.

2- Essential References.
1- Pradelli, L., Wertheimer, A. (2012). Pharmacoeconomics: Principles and Practice, 1st edition, SEED 2- Zaheer-UD-Din Baber (editor), 2019. Encyclopedia of pharmacy practice and clinical pharmacy. Fir edition. Elsevier Inc.
3- Electronic Materials and Web Sites *etc.*

XXI.	Course Policies:
1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** Assignments and projects will be assessed individually unless the teacher request for group work
5	**Cheating**: Cheating by any means will cause the student failure and he/she must re-study the course
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:**

Template for Course Plan (Syllabus) of Pharmacoeconomics

XXVII. - Information about Faculty Member Responsible for the Course:

		Office Hours					
Name of Faculty Member							
Location& Telephone No.		SAT	SUN	MON	TUE	WED	THU
E-mail							

XVIII. Course Identification and General Information:

1-	Course Title:	Pharmacoeconomics				
2-	Course Number & Code:	PHA589				
3-	Credit hours:	C.H				Total
		Th.	Seminar	Pr.	F. Tr.	
		2				2
4-	Study level/year at which this course is offered:	Fifth level/second semester				
5-	Pre –requisite (if any):	Drug Information				
6-	Co –requisite (if any):					
7-	Program (s) in which the course is offered	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8-	Language of teaching the course:	English Language				
9-	System of Study:	Semester				
10-	Mode of delivery:	Regular				
11-	Location of teaching the course:	University				

XXIX. Course Description:

This course is designed to provide students with the basic concepts of pharmacoeconomics and its use in healthcare decision-making. The course covers the measurement of costs, assessment of economic, clinical, and humanistic outcomes, the four basic types of pharmacoeconomic research, i.e. cost-minimization analysis, cost-effectiveness analysis, cost-utility analysis, and cost-benefit analysis. In addition, it covers the decision analysis.

XXX. Course Objectives:

7- Describe the basic concepts of pharmacoeconomics and its importance and relationship to clinical pharmacy and pharmacy practice.
8- Determine the difference between the most common types of pharmacoeconomics studies.
9- Define different costing terms, types, and ways of cost calculation.
10- Understand the applicability of decision analysis method.

XXXI. Intended learning outcomes (ILOs) of the course:

- Brief summary of the knowledge or skill the course is intended to develop:

1- Explain the basic concepts and principles of pharmacoeconomics and its application in drug therapy decision and formulary management.
2- Describe the differences between the types of pharmacoeconomics studies and their advantages and disadvantages.
3- Identify the different types of costs and outcomes included in pharmacoeconomics evaluation.
4- Relate the concept of pharmacoeconomics to patient care.
5- Integrate the pharmacoeconomics principles with knowledge of pharmaceutical and clinical sciences in developing the formulary list.
6- Apply pharmacoeconomics to drug therapy decision and formulary management.
7- Communicate and present the economic information.

XXXII. Course Content:

- Distribution of Semester Weekly Plan of Course Topics/Items and Activities.

A – Theoretical Aspect:

Order	Topics List	Week Due	Contact Hours
1	**Introduction to Pharmacoeconomics** - What is pharmacoeconomics? - Why is pharmacoeconomics Important? - Relationship of pharmacoeconomics to Other Research - Types of pharmacoeconomic Studies	1st	2
2	**Essential medicines lists and the role of pharmacoeconomic** - Definition and rationale of essential medicines - Selection of essential medicines - WHO model list of essential medicine and model formulary - Role of pharmacoeconomics in developing essential medicines lists and formulary	2nd	2
3	**Measuring and estimating costs** - Costing Terms - Cost Categorization and Alternative methods - Perspective	3rd	2
4	- Timing adjustment costs - Resources for cost Estimations - Example - Incremental calculation	4th	2
5	**Cost Minimization Analysis (CMA)**	5th	2

6	**Cost effectiveness Analysis (CEA)** - Cost effectiveness Analysis (CEA) - Presentation of Cost-Effectiveness Analysis	6th	2
7	**Cost effectiveness Analysis (CEA)** Cost-Effectiveness Grid	7th	2
8	**Mid-term exam**	8th	2
9	**Cost effectiveness Analysis (CEA)** Cost-Effectiveness Plane	9th	2
10	**Cost Utility Analysis (CUA)** - Overview of CUA Methods used in determining utilities - Rating scale	10th	2
11	**Cost Utility Analysis (CUA)** - Standard Gamble - Time Trade off - Differences between different methods	11th	2
12	**Cost Utility Analysis (CUA)** - Calculating QALY - Comparison using the CUA	12th	2
13	**Cost Benefit analysis** - Definition - Advantages and Disadvantages of CBA - Conducting a CBA - Calculating Results of Costs and Benefits	13th	2
14	**Cost Benefit analysis** - Differences between costs versus benefits - Measuring Indirect and Intangible Benefits - Human Capital Method - Bidding Vehicles	14th	2
15	**Decision analysis** Decision Tree analysis	15th	2
16	**Final term exam**	16th	2
Number of Weeks /and Units Per Semester		**16**	**32**

XXIII. Teaching strategies of the course:

- Interactive Lectures
- Self-Learning
- Assignments
- Case-Study
- Problem-based Learning
- Discussion

XXIV. Assignments:

No	Assignments	Week Due	Mark
1	Participation, Homework Assignments	Weekly	**2.5**
2	Exercises	Weekly	**2.5**
3	Total		**5**

XXXV. Schedule of Assessment Tasks for Students During the Semester:

Assessment	Type of Assessment Tasks	Week Due	Mark	Proportion of Final Assessment
1	Tasks and Assignments	**1-14**	**5**	5%
2	Quizzes 1	**W6**	2.5	2.5%
3	Mid-term exam	**W7**	20	20%
4	Quizzes 2	**W12**	2.5	2.5%
5	Final exam	**W16**	70	70
	Total		**100**	**100**

XXVI. Learning Resources:

1- Required Textbook(s) (maximum two).

1- Karen Rascati. (2014). Essentials of Pharmacoeconomics. 2nd edition, Lippincott Williams & Wilkins.
2- Thomas, D. (editor). 2019. Clinical pharmacy education, practice and research. First edition. Elsevier Inc.

2- Essential References.

1- Pradelli, L., Wertheimer, A. (2012). Pharmacoeconomics: Principles and Practice, 1st edition, SEED Srl.

2- Zaheer-UD-Din Baber (editor), 2019. Encyclopedia of pharmacy practice and clinical pharmacy. First edition. Elsevier Inc.
3- Electronic Materials and Web Sites *etc*.

XXVII. Course Policies:	
1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects:** Assignments and projects will be assessed individually unless the teacher request for group work
5	**Cheating**: Cheating by any means will cause the student failure and he/she must re-study the course
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the faculty rules.
7	**Other policies:**

Course Specification of Pharmaceutical Field Training (3)

I. General Information:

1.	**Course Title:**	Pharmaceutical Field Training (3)				
2.	**Course Code:**	PHA593				
3.	**Course Type:**	Program Requirements				
4.	**Credit Hours:**	**Credit Hours**	**Theory Contact Hours**		**Practical Contact Hours**	
			Lecture	**Tutorial/Seminar**	**Lab**	**Field training**
		5	--	--	--	200
5.	**Level/ Semester at which this Course is offered:**	Fifth Level / second Semester				
6.	**Pre –Requisite (if any):**	Pharmaceutical Field Training (2)				
7.	**Co –Requisite (if any):**	------				
8.	**Program (s) in which the Course is Offered:**	Bachelor of pharmaceutical sciences				
9.	**Language of Teaching the Course:**					
10.	**Location of Teaching the Course:**	Hospital setting				
11.	**Prepared by:**	Dr. Mujeeb M. Al-Nahari Dr. Bssam Al-Shaibani Hamad Mahmood Mohammed				
12.	**Date and Number of Approval by Council:**					

II. Course Description:

This course is the third of a series of three courses designed to provide students with a variety of practice-based opportunities that apply the knowledge and skills gained during their study. The opportunities will occur in select clinical and industrial based pharmacy practice sites and structured around a number of formalized activities.

III. Course Description:

III. Course Intended Learning Outcomes (CILOs): Upon successful completion of the course, students will be able to:		Referenced PILOs	
A. Knowledge and Understanding:			
a1	Demonstrate appropriate depth and breadth of pharmacotherapeutics and disease-related knowledge for a variety of common conditions encountered in different healthcare setting.	**A1**	Demonstrate a broad knowledge of the principles of general, basic and biomedical sciences that are pertinent to practice of pharmacy.
		A3	Explain competently the pharmacological effects, therapeutic efficacy and safety of pharmaceutical and related products.
a2	Describe the different unit operations and processes in pharmaceutical plant and different type of machines used for manufacturing and quality assurance various dosage forms according to cGMP guidelines.	**A2**	Demonstrate the essential knowledge of techniques and the key stages in drug and biopharmaceuticals discovery, development, manufacturing; and controlling and ensuring their quality.
B. Intellectual Skills:			
b1	Correlate the patient and drug information to identify the medication-related problems and health related needs and recommend the appropriate pharmaceutical plan under the preceptor 's supervision.	**B3**	Practice thinking skills in designing pharmaceutical plans to optimize medication use and reduce the possibility of medication errors, and in solving problems related to pharmaceutical preparations and other related sciences.
		B4	Integrate knowledge of pharmaceutical sciences with social, behavioral, administrative; and clinical sciences to enhance the healthcare systems including pharmaceutical industries.

C. Professional and Practical Skills:			
c1	Develop a pharmaceutical care plan using evidence- based medicine for specific related diseases under the preceptor 's supervision.	**C2**	Provide pharmaceutical care, where appropriate, within the pharmacist scope of practice and expertise and in accordance with GPP and GCP, where applicable.
c2	Demonstrate the abilities to perform the different steps of dosage form manufacturing and participate in quality control activities based on cGMP guidelines.	**C1**	Apply professional skills and techniques in each stage of drug and pharmaceuticals discovery from their various sources, development, manufacturing, controlling their quality, and in other related sciences, taking into account the professional standards and principles.
C3	Counsel the patients, caregivers and other healthcare professionals about the appropriate use of medications, devices, health promotion and disease prevention under the preceptor 's supervision.	**C4**	Provide counselling and advise to patients, their families, community and other health care professionals about safe and rational use of medicines and medical devices, self-care and health promotion and disease prevention.
D. Transferable Skills:			
d1	Demonstrate time management, team work, communication, life-long learning skills and professionalism.	**D1**	Demonstrate good ability at effective management and leadership, critical thinking, problem solving, communication skills, use of modern technology, and collaboration with others.
		D2	Develop his/her scientific and professional capabilities, especially in the field of pharmaceutical practice, and continues his/her graduate studies and continuous learning to enhance professional competence.

d2	Utilize the appropriate information resources to provide accurate and credible information about health and drugs.	**D3**	Assess the requirements of research and resources of Information related to drug discovery, development of pharmaceutical products and pharmaceutical-care practice.

IV. Alignment of Course Intended Learning Outcomes

(A) Alignment of Course Intended Learning Outcomes (Knowledge and Understanding) to Teaching Strategies and Assessment Methods:

	Course Intended Learning Outcomes	Teaching Strategies	Assessment Strategies
a1	Demonstrate appropriate depth and breadth of pharmacotherapeutics and disease-related knowledge for a variety of common conditions encountered in different healthcare setting.	- Case-Study - Self-Learning - Projects - Discussion - Field-training	- Oral Exams - Oral Presentation & Seminar Assessment - Assignments & Coursework Activities - Reports of Assignments - Cases Presentation
a2	Describe the different unit operations and processes in pharmaceutical plant and different type of machines used for manufacturing and quality assurance various dosage forms according to cGMP guidelines.		

(B) Alignment of Course Intended Learning Outcomes (Intellectual Skills) to Teaching Strategies and Assessment Methods:

	Course Intended Learning Outcomes	Teaching Strategies	Assessment Strategies
b1	Correlate the patient and drug information to identify the medication-related problems and health related needs and recommend the appropriate pharmaceutical plan under the preceptor 's supervision.	- Feedback learning - Case-Study - Feedback learning - Projects - Discussion - Problem-based Learning - Field-training	- Oral Presentation & Seminar Assessment - Assignments and reports - observation - Problem Solving

		- Simulation - Cooperative learning	Exercise - Cases Presentation

(C) Alignment of Course Intended Learning Outcomes (Professional and Practical Skills) to Teaching Strategies and Assessment Methods:

	Course Intended Learning Outcomes	Teaching Strategies	Assessment Strategies
c1	Develop a pharmaceutical care plan using evidence- based medicine for specific related diseases under the preceptor 's supervision.	- Feedback learning - Case-Study - Feedback learning - Projects - Problem-based Learning - Field-training - Simulation - Cooperative learning	- Assignments & Coursework Activities - Problem Solving Exercise - Cases Presentation - Work samples, such as, Pharmacy Practice Manual, Logbooks and Portfolios Multi-source assessments, such as Student Self-Assessment
c2	Demonstrate the abilities to perform the different steps of dosage form manufacturing and participate in quality control activities based on cGMP guidelines.		
c3	Counsel the patients, caregivers and other healthcare professionals about the appropriate use of medications, devices, health promotion and disease prevention under the preceptor 's supervision.		

(D) Alignment of Course Intended Learning Outcomes (Transferable Skills) to Teaching Strategies and Assessment Methods:

	Course Intended Learning Outcomes	Teaching Strategies	Assessment Strategies
d1	Demonstrate time management, team work, communication, life-long learning skills and professionalism.	- Feedback learning - Case-Study - Feedback learning - Projects - Discussion - Problem-based Learning	- Oral Presentation & Seminar Assessment - Assignments & Coursework Activities - Problem Solving Exercise - Cases Presentation - Work samples, such as,
d2	Utilize the appropriate information resources to provide accurate and credible		

	information about health and drugs.	- Field-training - Simulation - Computer aided learning - Cooperative learning	Pharmacy Practice Manual, Logbooks and Portfolios

V. Course Contents:

Practical Aspect (Lab/Clinical) (if any):

No.	Tasks/ Experiments	Number of Weeks	Contact Hours 18hrs/week	Learning Outcomes (CILOs)
1	**Clinical pharmacy training: inpatient (Emergency room)** - Daily rounds and morning meetings with the assigned medical team. - Identification of actual and potential drug therapy related problems. - Preparation of a detailed pharmaceutical care plan for patients assigned by the preceptor using the pharmacist's patient care process and SOAP note. - Patient case presentation.	9.5	160	**a1, b1, c1, c3, d1-d2**
2	**Clinical pharmacy training: inpatient (Obstetrics and gynecology)** - Daily rounds and morning meetings with the assigned medical team. - Identification of actual and potential drug therapy related problems. - Preparation of a detailed pharmaceutical care plan for patients assigned by the preceptor using the pharmacist's patient care			

No.	Tasks/ Experiments	Number of Weeks	Contact Hours 18hrs/week	Learning Outcomes (CILOs)
	process and SOAP note. - Patient case presentation.			
3	**Clinical pharmacy training: inpatient (pediatrics)** - Daily rounds and morning meetings with the assigned medical team. - Identification of actual and potential drug therapy related problems. - Preparation of a detailed pharmaceutical care plan for patients assigned by the preceptor using the pharmacist's patient care process and SOAP note. - Patient case presentation.			
4	- Clinical pharmacy training: inpatient (oncology) - Daily rounds and morning meetings with the assigned medical team. - Identification of actual and potential drug therapy related problems. - Preparation of a detailed pharmaceutical care plan for patients assigned by the preceptor using the pharmacist's patient care process and SOAP note. - Patient case presentation.			
5	**Industrial training:** - Manufacturing process of various dosage forms: liquid, solid, semisolid and other production lines and plant layout.	2.5	40	**a2, c2, d1-d2**

No.	Tasks/ Experiments	Number of Weeks	Contact Hours 18hrs/week	Learning Outcomes (CILOs)
	- Various manufacturing machines. - Quality control, quality assurance process, GMP, store specification and sampling, validation.			
Number of Weeks /and Units Per Semester		**12**	**200**	

VI. Assignments:

No.	Assignments	Week Due	Mark	Aligned CILOs (symbols)
1	**Logbook/reports**	**Weekly**	**10**	**a1, b1, c1, c3, d1-d2**
Total			**10**	

VII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	**Field supervisor** - Behaviours: 10% - Assignments & activities 20%	Daily	30	30%	a1-a2, b1, c1-c3, d1-d2
2	**Academic supervisor** - Logbook/reports 10% - Behaviours: 10% - Seminars 10%	Weekly	30	30%	a1-a2, b1, c1-c3, d1-d2
3	**Training committee** - Attendance 10% - Final exam 30%	At the end	40	40%	a1-a2, b1, c1-c3, d1
Total					

VIII. Learning Resources:

1- Required Textbook(s) (maximum two):

9- James, E.F, Reynolds, Parfitt, K., 2007, Martindale, "The extra pharmacopeia", 31st edition, Royal Pharmaceutical Society, London.

10- Chisholm-Burns, M. A., Wells, B. G., & Schwinghammer, T. L. (2019). Pharmacotherapy principles and practice, 5th edition. New York: McGraw-Hill.

Latest editions of all the suggested books are recommended.

2- Essential References:

11- Remington's, The science and practice of pharmacy, 2000., Philadelphia college of pharmacy and science, 20th edition Philadelphia, USA,

12- DiPiro, J. T., Talbert, R. L., Yee, G. C., Matzke, G. R., Wells, B. G., & Posey, L. (2020). Pharmacotherapy A Pathophysiologic Approach, 11th edition. Pharmacotherapy: A Pathophysiologic Approach. New York: McGraw-Hill Education.

Latest editions of all the suggested books are recommended.

3- Electronic Materials and Web Sites etc.:

1- **www.accesspharmacy.com**
2- **Disease management guidelines**
3- **https://www.medscape.com/**

Course Specification of Graduation Project

I. Course Identification and General Information:

1	Course Title:	**Graduation Project**				
2	Course Code & Number:	**PHA594**				
3	Credit hours:	C.H				TOTAL
		Th.	Seminar	practical	Training.	
				2		2
4	Study level/ semester at which this course is offered:	Fifth year second semester				
5	Pre –requisite (if any):	Research methodology and biostatistics				
6	Co –requisite (if any):	None				
7	Program (s) in which the course is offered:	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	Language of teaching the course:	English				
9	Study System	Semester-based				
10	Mode of delivery:	Regular				
11	Location of teaching the course:	University				
12	Prepared By:	Mohammed Hassan				

II. Course Description:

This course provides students with opportunities to implement the skills gained during previous courses studied in the program toward providing a solution to a specific problem in health field. This course correlates what has been taught in research methodology and biostatistics and integrates all developed skills into completion of a self-directed supervised group project focused on a health -related research task.

III. Course Objectives:

This course aims to:

1- Help last year pharmacy students develop the ability to synthesize a research question
2- Teach the students to appraise the literature related to the research question.
3- Assist students to develop skills of data collection, analysis, interpretation.
4- Empower students to express advanced oral and written communication skills including the presentation of a research report.
5- Involve the students in teamwork – centered activities throughout research and report defense.

IV. Course Intended learning outcomes (CILOs) of the course		WRITE Symbol and number of PILOs
After completing this course, students will be able to:		
a.1	Demonstrate the basic concepts of research methodology, the study design, research project planning steps; data collection, analysis, interpretation and biostatistics.	A1
a.2	Identify the ethics & professional responsibilities of a researcher.	A2
b.1	Use appropriate research methods to solve health problems.	B3
b.2	Formulate and evaluate a research strategy in the selected health research field.	B2
c.1	Conduct research studies and utilize the results in different health fields including drug discovery.	C1
c.2	Comply with the ethics, laws, regulations and standards of the pharmacy profession on handling pharmaceutical researches.	C5
d.1	Manage a research project in term of financial, time management and decision-making.	D2,D3
d.2	Apply information and communication technology and work independently or as a part of team in different research fields.	D1

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
After completing this course, students will be able to:	- Orientation - Self-directed reading	Cumulative Assessment by advisor
a1- Demonstrate the basic concepts of research methodology, the study design, research project planning steps; data collection, analysis, interpretation and biostatistics.		
a2- Identify the ethics & professional responsibilities of a researcher.		

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
After completing this course, students will be able to:		
b1- Use appropriate research methods to solve health problems.solve health problems	- Regular group meetings - Assigned reading - Working in groups	- Proposal grading - Final report - Final defense - Cumulative Assessment by advisor
b2- Formulate and evaluate a research strategy in the selected health research field.		

(C) Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
After completing this course, students will be able to:	- Regular group meetings - Assigned reading - Working in groups	- Proposal grading - Final report - Final defense - Cumulative Assessment by advisor -
c1- Conduct research studies and utilize the results in different health fields including drug discovery.		
c2- Comply with the ethics, laws, regulations and standards of the pharmacy profession on handling pharmaceutical researches.		

(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
After completing this course, students will be able to:	- Regular group meetings - Assigned reading - Working in groups	- Proposal grading - Final report - Final defense - Cumulative Assessment by advisor
d1- Manage a research project in term of financial, time management and decision-making.		
d2- Apply information and communication technology and work independently or as a part of team in different research fields.		

V. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Learning Outcomes	Sub Topics List	No. of Weeks	contact hours
1	Graduation project orientation	a1,a2,	Introduction, Expected outcomes, relevant	1	2

			concepts, assessment		
2	Project concept stage	a1,a2b1,b2	Ideas brainstorming	1	2
3	Submission of project proposal	a1,a2b1,b2,d3	Proposal submitted to the scientific committee	1	2
4	Approval of projects	a1,a2b1,b2,d2	The decision of the scientific committee is announced	1	2
5	Carrying out research activities	a1,a2b1,b2,d1,d2	The period of the actual carrying out of project studies	10	20
6	Final report Submission	a1,a2b1,b2,c1, c2, d1,d2		1	2
7	Final presentation	a1,a2b1,b2,c1, c2, d1,d2		1	2
Number of Weeks /and Units Per Semester				**16**	**32**

VI. Teaching strategies of the course:

- Orientation
- Self-directed reading
- Regular group meetings
- Assigned reading
- Working in groups

VII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Proposal	4	30	30%	b1,b2.c1,c2,c3,d1,d2,
2	Cumulative Assessment by advisor	14	30	30%	a1,a2,b1,b2.c1,c2,d1,d2
3	Final report	15	20	20%	a1,a2,b1,b2.c1,c2,d1,d2
4	Final presentation	16	20	20%	a1,a2,b1,b2.c1,c2,d1,d2
Total			100	100%	

VIII. Learning Resources:

1- Required Textbook(s) (maximum two).

Reading with be assigned according to the research project

2- Essential References.

Stuart MC, (2007), The complete guide to medical writing, 1st edition, Pharmaceutical Press, London.

3- Electronic Materials and Web Sites *etc.*

	1- www.pubmed.com 2- www.sceincedirect.com

IX. Course Policies:	
1	**Class Attendance:** - At least 75 % of the course hours should be attended by the student. Otherwise, he/she will not be allowed to attend the final exam
2	**Tardy:** - any student who is late for more than 15 minutes from starting the lecture will not be allowed to attend the lecture and will be considered absent.
3	**Exam Attendance/Punctuality:** - any student who is late for more than 30 minutes from starting the exam will not be allowed to attend the exam and will be considered absent.
4	**Assignments & Projects**: - Assignments and projects will be assessed individually unless the teacher request for group work
5	**Cheating**: - Cheating by any means will cause the student failure and he/she must re-study the course
6	**Plagiarism**: Plagiarism by any means will cause the student failure in the course . Other disciplinary procedures will be according to the faculty rules.
7	**Other policies**:

Template for Course Plan (Syllabus) of Graduation Project

X. - Information about Faculty Member Responsible for the Course:								
Name of Faculty Member		Office Hours						
Location& Telephone No.		SAT	SUN	MON	TUE	WED	THU	
E-mail								

I. Course Identification and General Information:						
1	Course Title:	Graduation Project				
2	Course Code & Number:	PHA594				
3	Credit hours:	C.H				TOTAL
		Th.	Seminar	practical	Training.	
				2		2
4	Study level/ semester at which this course is offered:	Fifth year/Second semester				
5	Pre –requisite (if any):	Research methodology and biostatistics				
6	Co –requisite (if any):	None				
7	Program (s) in which the course is offered:	Bachelor of pharmaceutical Sciences (B. Pharm. Sc)				
8	Language of teaching the course:	English				
9	Study System	Semester-based				
10	Mode of delivery:	Regular				
11	Location of teaching the course:	University				
12	Prepared By:	Mohammed Hassan				

II. Course Description:

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3- Assist students to develop skills of data collection, analysis, interpretation
4- Empower students to express advanced oral and written communication skills including the presentation of a research report.
5- Involve the students in teamwork – centered activities throughout research and report defense.

IV. Course Intended learning outcomes (CILOs) of the course

After completing this course, students will be able to:	
1	Demonstrate the basic concepts of research methodology, the study design, research project planning steps; data collection, analysis, interpretation and biostatistics
2	Identify the ethics & professional responsibilities of a researcher
3	Use appropriate research methods to solve health problems
4	Formulate and evaluate a research strategy in the selected health research field
5	Conduct research studies and utilize the results in different health fields including drug discovery
6	Comply with the ethics, laws, regulations and standards of the pharmacy profession on handling pharmaceutical researches
7	Manage a research project in term of financial, time management and decision-making
8	Apply information and communication technology and work independently or as a part of team in different research fields

V. Course Content:

A – Practical Aspect:

Order	Topics List	Sub Topics List	No. of Weeks	contact hours
1	Graduation project orientation	Introduction, Expected outcomes, relevant concepts, assessment	1	2
2	Project concept stage	Ideas brainstorming	1	2
3	Submission of project proposal	Proposal submitted to the scientific committee	1	2
4	Approval of projects	The decision of the scientific committee is announced	1	2
5	Carrying out research activities	The period of the actual carrying out of project studies	10	20
6	Final report Submission		1	2

7	Final presentation	1	2
Number of Weeks /and Units Per Semester		**16**	**32**

VI. Teaching strategies of the course:

- Orientation
- Self-directed reading
- Regular group meetings
- Assigned reading
- Working in groups

VII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Proposal	4	30	30%	b1,b2.b3. c1,c2,c3,d1,d2,d3
2	Cumulative Assessment by advisor	14	30	30%	a1,a2,a3,b1,b2.b3. b4 c1,c2,c3,d1,d2, d3
3	Final report	15	20	20%	a1, a2, a3, b1, b2. b3. b4 c1,c2,c3,d1,d2, d3
4	Final presentation	16	20	20%	a1, a2, a3, b1, b2. b3. b4 c1,c2,c3,d1,d2, d3
Total			100	100%	

VIII. Learning Resources:

1- Required Textbook(s) (maximum two).

Reading with be assigned according to the research project

2- Essential References.

Stuart MC, (2007), The complete guide to medical writing, 1st edition, Pharmaceutical Press, London.

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